MACRO ENVIRONMENT AND PERFORMANCE OF ROADS CONSTRUCTION PROJECTS IN NAIROBI CITY COUNTY, KENYA

AKUTO MUSAEH BP KAMARKOR

D86/CTY/28446/2019

A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS, ECONOMICS AND TOURISM IN PARTIAL FULFILMENT FOR THE AWARD OF DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS (PROJECT MANAGEMENT) OF KENYATTA UNIVERSITY

AUGUST 2024

DECLARATION

Declaration by candidate:

This work is original and has not been submitted for an award or any other recognition at any other university.

Signature: …… Date:……

Akuto Musaeh B.P Kamarkor

D86/CTY/28446/2019

Declaration by supervisor:

We affirm that the student completed the work presented in this Thesis under our instructions and supervision.

.

Signature: …… Date:……

Dr. Paul K. Sang (PhD)

Senior lecturer

Department of Management Science,

School of Business, Economics and Tourism,

Kenyatta university

Signature: …… Date:……

Dr. David Nzuki (PhD)

Lecturer

Department of Management Science,

School of Business, Economics and Tourism,

Kenyatta university

DEDICATION

This thesis is dedicated to my family, whose unwavering patience, unwavering support, and steadfast support throughout my entire academic journey have been instrumental in my success. I will always be grateful for their invaluable contributions.

ACKNOWLEDGEMENT

I would like to acknowledge the Almighty God for the courage, strength, grace and guidance while going through the PhD course work and writing this thesis.

I convey thankfulness to my supervisors, Dr. Paul K. Sang and Dr. David Nzuki, for their exceptional guidance, support, and commitment to ensuring the successful completion of this thesis. Your recommendations and corrections enhanced the quality of my thesis, resulting in a polished and professional final product. I am sincerely appreciative. I also convey my thankfulness to all the teachers in the Department of Management Science for their availability and assistance in clarifying numerous difficulties related to my thesis.

I convey my appreciation to my wife, Isabella Cherotich Ptoo Akuto, for her steadfast advice and assistance during my pursuit of a doctoral degree. I would want to convey thankfulness to Emmy, Warren, Winston, Wayne, and Musaeh Akuto JNR for their exceptional academic achievements, which have motivated and encouraged me to pursue further study. To my cherished family, particularly my father Kamarkor Akuto and mother Miriam Wilson, as well as my siblings Simon, Penina, Samson, John, Trizah, the late Samwel, and Zehrah, I want to convey my sincere thanks for being a constant source of support during my academic journey. Your unwavering moral and spiritual guidance has been invaluable to me.

To my fellow students at the university, particularly Raphael, Elizabeth, Olive, and Mercyline, I offer my appreciation for your willingness to share and show concern. The chats, emails, and phone calls were crucial in making the process smoother.

Lastly, I wish to convey my sincere thanks to the management of Kenyatta University, particularly the administrators in the department, for their unwavering support during this time.

May God bless you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

OPERATIONAL DEFINITION OF TERMS

Economic Factors: These pertain to conditions such as interest rates, taxes, management and labor costs that determine the present and future value of an investment portfolio and may impact the execution of a project. Within this study, these facets encompass the accessibility of financing and credit, labor costs, fluctuations in the price of construction materials, foreign exchange rates, inflation rates, and interest rates.

Government Policy: This refers to an institutionalized framework or a defined set of elements, including laws, regulations, guidelines, and actions, aimed at resolving or addressing pertinent issues related to the performance of initiatives, such as roads construction projects in Nairobi City County. Government policies constitute a bundle of rules and regulations enacted to facilitate the development, management, rehabilitation, and maintenance of road infrastructure.

Macro Environment: The major external factors that impact an organization's decision-making, strategies, and performance, and are typically beyond its control. These include social-cultural factors, economic factors, technological factors, political factors, and ecological and legal conditions. In this study, the macro environment refers to the broad external conditions affecting the performance of road construction projects in Nairobi City County.

Political factors: This involves the interference from the government system and politicians that may impact the performance of a project. Within this study, these dimensions encompass political leadership, hierarchical bureaucracy, government funding, political instability, fraudulent and corrupt practices, and political interference.

Project Performance: This denotes the extent to which project goals and objectives are achieved within the agreed-upon budget and time for the quality delivery of a project. In this study, these dimensions include time, cost, quality, and stakeholder satisfaction for each project.

Social-cultural attributes: These are the forces within a society that influence the thoughts, feelings, and beliefs of individuals and may affect the implementation of a project. Within this study, these attributes include land customs, community attitudes, community beliefs and norms, local community literacy levels, safety emphasis, and lifestyle patterns.

Stakeholder involvement: This refers to engaging the parties affected or influenced by a project. In this study, this variable is elucidated by participation in identification, stakeholder planning, participation in analysis, monitoring and control, stakeholder conflict and disputes management, and communication and coordination efficiency.

Technological factors: These are influences that impact the way a company operates with respect to the equipment used within the company's environment. In this study, these aspects include the availability of construction technology, advanced construction methods and materials, process automation/digitization, research and development activities, technology incentives, and technological infrastructure.

ABBREVIATIONS AND ACRONYMS

CDF	Constituency Development Funds
EMFs	Emerging Market Firms
GDP	Gross Domestic Product
IT	Information Technology
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KRB	Kenya Roads Board
KURA	Kenya Urban Roads Authority
MoTIHUDPW	Ministry of Transport, Infrastructure, Housing, Urban. Development, and Public Works
NMA	Nairobi Metropolitan Area
NMT	Non-Motorized Transport
PAPs	Projects Action Plans
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
TMTs	Top Management Teams

ABSTRACT

Despite being critical for Kenya's economic development, road construction projects in Nairobi City County frequently experience significant performance issues. These challenges are largely due to a variety of environmental factors that disrupt project success. Consequently, this study aimed to explore the relationship between the macro environment and the performance of roads construction projects in Nairobi City County, Kenya. The specific objectives included establishing the connections between socio-cultural factors, economic factors, technological aspects and political factors with the performance of roads construction projects in Nairobi City County. Additionally, the research aimed to assess the moderating impact of government policies on the relationship between macro environment factors and project performance. Furthermore, it aimed to evaluate the mediating influence of project stakeholders' involvement on the connection between macro environment factors and project performance. The theoretical foundations guiding this study encompassed Systems Theory, stakeholder theory, upper echelons' theory, and contingency theory. Utilizing a positive research philosophy, the study adopted a descriptive and explanatory research design. Nairobi City County, in this context, referred to the five counties in the Nairobi Metropolitan Area: Nairobi County, Kiambu County, Kajiado County, Machakos County, and Murang'a County. The target audience comprised the 176 completed roads construction projects in Nairobi City County executed by the Kenya Rural Roads Authority (KERRA). The unit of observation encompassed road engineers, project planners, and directors (KERRA), road supervisors, road inspectors, road surveyors, contractors, and members of project implementation teams (KERRA). The unit of analysis focused on the completed roads construction projects in Nairobi City County. Proportional stratified sampling was employed to determine a sample size of 253 respondents. Data collection involved the use of a structured questionnaire, with reliability tested through the split-half method and content validity employed for validity. Descriptive statistics were produced, including frequencies, percentages, mean scores, and standard deviation. The study carried out diagnostic tests, including normality test, heteroscedasticity test, linearity test, and multicollinearity test. Multiple linear regression, an inferential statistical technique, was utilized. The results were displayed through tables. The study unveiled a positive and significant relationship between socio-cultural factors, economic factors, technological factors, and political factors with project performance. Furthermore, it identified that government policies exerted a moderating effect on project performance and project stakeholder involvement played a partial mediating role in project performance. In conclusion, the study establishes a discernible relationship between socio-cultural, economic, technological, and political factors and project performance. The research recommends that project managers and policymakers collaborate with local communities to integrate their cultural practices and lifestyle patterns into project planning and execution. The research recommends that project planners and financial institutions implement robust mechanisms for interest rate management to minimize financing risks. Project managers are urged to embrace digitization and automation, leveraging on technology to address complex technicalities before and during construction. To maintain adequate government funding, the study advocates for continued advocacy efforts to highlight the positive impact of infrastructure projects on local development. Furthermore, ongoing efforts to streamline procurement processes and eliminate corruption are encouraged to ensure a conducive environment for successful project outcomes. The outcome of the study would be useful to scholars, policy makers, and project management experts and stakeholders. The study suggests that macro environment factors not considered in the current study can be studied in other studies.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Inadequate performance in road construction projects has negative effects on finances, client satisfaction, and reputation. Timeliness and quality of project completion are often compromised, resulting in delays that obstruct intended benefits and increase project costs. The environments in which projects are conducted play a critical role in determining their success and the decisions made. These environments consist of internal elements such as strategies, policies, financial resources, human resources, business image, and equipment, and also external elements like as political, economic, social, technological, environmental, and legal aspects (An, Razzaq, Nawaz, Noman & Khan, 2021).

Globally, the PESTEL framework—which refers to political, economic, social, technical, environmental, and legal environments—significantly impacts strategic management. According to Lu et al. (2020), this framework helps strategists recognize large-scale opportunities and risks that may lead to significant organizational changes. The competitiveness and survival of projects depend heavily on how well they respond to the macro environment and strategic positioning. It is imperative to perform a comprehensive macro environment scan to identify both opportunities and hazards. The macro environment, encompassing political, economic, technological, and legal contexts, plays a crucial role, with government actions serving as a moderating element that can either positively or negatively impact project performance.

An increasing body of research demonstrates a clear connection between the success of global efforts and the overall macro environment (Sabahi & Parast, 2020). Although it is recognized that the macro environment has a significant impact on performance, it is equally crucial to understand the functions of governmental rules and project stakeholder involvement (Olawale & Sun, 2018). The upper echelons theory, contingency theory, systems theory, and stakeholder theory collectively provide a framework that explains the connection between government policies, the macro environment, stakeholder involvement, and project performance.

Understanding the roles of project stakeholders and government policies is essential as businesses navigate the complexities of the macro environment (Olawale & Sun, 2018).

Contingency theory suggests that effective risk management takes place when several factors in the company's macro environment come together in a way that enables the implementation of strategies that lead to desired results (Araral, 2020). The upper echelons theory investigates the correlation among organizational procedures, performance, legislation, and strategic decisions (Bassyouny, Abdelfattah & Tao, 2020). According to systems theory, organizations are considered as systems that continuously interact with their environment. They adjust their operations based on both internal and external elements in order to meet the requirements of the environment (Van Assche et al., 2019). The stakeholder theory highlights that the effectiveness of an organization is contingent upon its capacity to create value for a diverse range of stakeholders (Freeman, Dmytriyev & Phillips, 2021).

Regionally, performance issues in road construction projects are often due to delays caused by bureaucratic government initiatives. For example, in the USA, the Standish Group reported that only 32% of road construction projects were completed on schedule, under budget, and to the expected standard of quality. However, 24% were terminated before completion due to failure, and 44% went over budget and schedule (Chaouk, Pagliari & Moxon, 2020). In Sri Lanka, the efficient allocation of donated funds in road building projects sponsored by donors is hindered by issues related to project delivery, resulting in expensive project implementations and contract terminations (San Santoso & Gallage, 2019).

In Europe, enhanced road building practices and advanced technologies lead to expedited and more streamlined project completion (Ahmed, 2021). On the other hand, the use of modern materials and techniques, such as prefabricated and modular construction, in China enables road construction projects to be finished with minimal use of resources (Opawole et al., 2019). Constructing road infrastructure in China not only enhances the quality of life but also generates employment opportunities (Masovic, 2018).

Locally, road construction project performance remains a significant challenge in Kenya. The government has increased financing for the road subsector to promote infrastructure development, in line with the big four agenda. Despite this, Kenya experiences a high rate of halted and delayed road projects (Odhiambo, 2021). More than 70% of existing projects in Kenya are expected to experience delays exceeding 50% of the planned timeline, while almost 50% of projects are estimated to have cost increases exceeding 20%. (Muriithi & Kiiru, 2021). Notably, projects like Thika Road and Langata Road, which were completed above budget and ahead of schedule, did not adhere to the expected 'iron triangle' relationship between time, cost, and scope.

The Kenyan government actively supports and oversees road construction, a primary focus of the transportation sector. The country's road network, valued at nearly Kshs 3.5 trillion as of 2021 and spanning 161.45 km, underscores the sector's importance (Kenya Roads Board's Annual Public Roads Programme 2021/2022). The Nairobi Metropolitan Area (NMA) currently has 939.6 km of continuing road construction and repair projects worth Kshs 162.4 billion; completed projects in 2021 totaled 99.7 km at a cost of Kshs 4.3 billion (Cytonn, 2021).

Cost overruns have been a recurring theme in government-funded construction projects for decades. Some projects have experienced cost increases exceeding 60% of their original contract value. Historical data indicates that cost performance has not improved significantly, suggesting a deficiency in substantial acquisition of knowledge in this field (Flyvbjerg et al., 2019). External factors such as political, technological, social, and economic environments shape the project environment (Kanyeria & Karugu, 2020).

Construction firms must adapt to dynamic business environments to thrive. Stakeholders are worried about the duration of road development projects due to many factors such as increasing interest rates for borrowing from commercial banks, inflation, exceeding budgeted costs, demands from project sponsors, and the possibility of disputes (Ahmed, 2021). The most common reason for performance problems in the construction sector is project delays. In Kenya, political

interference, inefficient reporting systems, and corruption are major causes of poor project performance. Additionally, the execution of road construction projects is further complicated by insufficient facilities, strained interpersonal connections, low staff motivation, societal and political challenges, and ineffective political leadership and administration (Chileshe, Njau, Kibichii, Macharia & Kavishe, 2022).

Understanding the global, regional, and local perspectives on the success of road construction projects reveals a complex interplay of macro environment factors, government regulation, and stakeholder involvement. Despite the significant investment and strategic importance of road infrastructure projects, challenges persist due to these external influences. This study aims to investigate these relationships in depth, focusing on Nairobi City County, Kenya, to provide insights and solutions that can improve project performance and contribute to achieving strategic development goals.

The persistent performance issues in road construction projects in Nairobi City County can be linked to various macro environment factors, government regulations, and stakeholder involvement. This study seeks to address these challenges by exploring their impact on project performance, thereby providing valuable insights for policymakers, project managers, and stakeholders. By comprehending and resolving these determinants, the study aims to boost the effectiveness and efficiency of road construction projects, ultimately contributing to the broader objectives of economic development and infrastructure improvement.

1.1.1 Project Performance

Restrictions on infrastructure projects include those related to quality, cost, and schedule (Sabahi & Parast, 2020). The essential standard of organizational performance is the center of evaluation for organizations, their behaviors, and their surroundings (Flyvbjerg et al., 2019). From a contextual perspective, organizational performance arises from the notion that an organization is a charitable gathering of productive resources (human, capital, and physical) with the aim of achieving a shared purpose. Performance evaluation may consider both non-financial and financial aspects (Assaad, El-Adaway & Abotaleb, 2020).

In contrast, Assaad, El-Adaway, and Abotaleb (2020) define project performance as the achievement of many, often conflicting project objectives concerning cost, quality, and production. Therefore, project performance refers to the process of executing and assessing a project with the primary goal of ensuring that it is effectively finished within the budget allotted, utilizing the anticipated resources, and yielding the intended high-quality results. Gruden and Stare (2018) emphasize time as a critical component and performance measure for projects. According to the Project Management Body of Knowledge (PMBOK) standard, there are four limitations on project performance that must be met: time, budget or cost, stakeholder satisfaction, and quality. This current study used time, cost, and quality as project performance measures to explore these relationships, aiming to provide insights that enhance project outcomes and contribute to strategic development goals.

Due to its limited, dynamic, and irreversible nature, time is an essential resource for project execution (Olawale & Sun, 2018). Given that projects have time constraints, time has a big impact on how well a project is measured. Moses (2019) asserts that a project's time performance is one of the most important variables to consider while evaluating its performance. Worldwide, a lot of projects have delays; according to Ahmed (2021), in Malaysia, delays affect 66.25 percent of commercial projects and 79.5 percent of public projects.

Opawole et al. (2019) state that extending a project's duration may lead to cost overruns due to incurred expenses for labor, materials, funds, and contract penalties. While Gruden and Stare (2018) attributed time overruns to both internal and external factors, Assaad, El-Adaway, and Abotaleb (2020) specifically mentioned social, economic, technological, political, and environmental difficulties as external contributions.

A project's quality is one of the most crucial variables to consider while assessing its success. In order to determine whether a project is functioning properly, consideration must be given to its duration, cost, and final product quality. Flyvbjerg

et al. (2019) state that a project's novelty and uniqueness, related project risks, and a lack of expertise and capacity to convert concepts into high-quality results all affect the project's quality. Ongoing delays and overruns in project completion in Kenya and many other developing countries underscore the need for research into the factors contributing to poor project performance. The purpose of this study is to determine whether macroenvironmental factors have an effect on road building project success in Nairobi County. Project performance is measured using a composite of time, cost, and quality.

Businesses evaluate the success of road projects using key performance measures like quality, money, and time. Using a set of standard indicators is an additional tactic. Owners, stakeholders, and end users are all included in the first set of indicators since they represent any group that looks at performance in a broad sense. The second group consists of developers and contractors who assess project performance on a micro level. Performance metrics can include one or many indications, depending on the specifics of the project. Assaad, El-Adaway, and Abotaleb (2020), for instance, showed how much the nature of the project, procurement procedures, coordination within the implementation team, contractor-client relationship, design team composition, and external circumstances all affect elements like contract duration and cost.

Road projects must be completed on schedule in order to satisfy all parties involved, including contracting companies, clients, and end users. Road construction project performance is correlated with both cost containment and timely project objective attainment (Sirisomboonsuk, Gu, Cao & Burns, 2018). Makoveyenko, Siden, and Pyliavskyi (2020) pointed to poor project timing, quality, and cost performance as the main cause of costly program difficulties. It is imperative to tackle the volatility associated with road construction project completion in terms of cost, timeliness, and projected quality. Stakeholders need to challenge the dominant project delivery strategies used in the African construction industry by reevaluating and possibly even reversing existing approaches. Every country's economic growth is largely dependent on its infrastructure, which includes building new highways and maintaining those that already exist. According to data from the World Bank, 64.94 percent of the

world's roads were paved in 2019. As a percentage of the entire road length in a nation, paved roads are those that are surfaced with cobblestones, concrete, bituminized agents, crushed stone (Macadam), and hydrocarbon binder.

Bezuhla and Bezuhla (2020) conducted an analysis of road construction projects in Lagos, Nigeria, and found that the reasons behind project delays were inadequate planning, delays, and government clearances and restrictions. According to Moses (2019), cost overruns and budgetary restrictions have a major impact on road development projects in Dar es Salaam. Kenya had 14.3% of its entire road network consisting of paved roads in 2020, according to the World Bank's report on global road projects (Kanyeria & Karugu, 2020). Three inland container depots, four international airports, numerous smaller airports, a major seaport in Mombasa, small ports in Lamu and Malindi, a ferry service to Uganda, an oil pipeline from Mombasa to Kisumu via Nairobi and Eldoret, a road network spanning 169,886 km, and 350,000 vehicles are all part of Kenya's transportation infrastructure (Kitonyi, Kibera, Gathungu & Yabs, 2020).

1.1.2 Road Projects in Nairobi City County

The five counties that make up the Nairobi Metropolitan Area—Nairobi County, Kiambu County, Kajiado County, Machakos County, and Murang'a County—are collectively referred to as "Nairobi City County" in this study. The Nairobi metropolitan area, home to over seven million of Kenya's 48 million people, serves as Kenya's principal economic and cultural center, contributing to 60 percent of the country's GDP (Chumba, 2020). As per the Article 187 of the Constitution, a Deed of Transfer of Functions Agreement was signed on 25 February 2020 between the Nairobi City County Government and the National Government, as published in Gazette Notice No.1609. This transfer delegated four functions, namely Health, Transport, Planning and Development, and Public Works, to the National Government. The Nairobi Metropolitan Area (NMA) was subsequently established on 18 March 2020 as the Institutional Framework tasked with executing these transferred functions on behalf of the National Government.

As part of its efforts to accelerate economic development, the government has consistently prioritized the enhancement of transport infrastructure, particularly roads, which stand as the predominant mode of transportation in the country. In 2018, the transport sector's entire production value was comprised of 62.9 percent roads, as reported by the Kenya Roads Board (2021). A notable project launched during that period is the Jomo Kenyatta International Airport (JKIA) - Westlands Expressway, an 18.6-kilometer road project commencing at JKIA and concluding at James Gichuru along Waiyaki Way Road in Westlands (Odhiambo, 2021). Presently, almost 463 kilometers of roads have been constructed in the Nairobi Metropolitan Area, with Kiambu County contributing the biggest proportion of road kilometers, accounting for 54.4 percent of the overall road projects. Nairobi dominates in terms of investment value, accounting for 96.3 percent of the total funds invested. The majority of these investments are focused on Class A highways, such as the JKIA-Westlands Expressway. In contrast, the current road developments in Kiambu and Machakos mostly focus on constructing main roadways (Kenya Roads Board, 2021).

Recent road projects accomplished in the region encompass the dualling of Ngong Road Phase I, the Outer Ring – Thika Road interlink, and the construction of the Interchange at City Cabanas. The 3 km Western Bypass from Ruaka Town to the Nakuru highway at Gitaru in Kiambu County, the 3.5 km Syokimau – Katani Road Phase II in Machakos County, and the Ngong Road Phase II (Dagoretti corner – Karen junction section) in Nairobi County are among the major ongoing road constructions in the area (Muriithi & Kiiru, 2021). The Nairobi Central Business District's Grogon and Kirinyaga Roads are almost finished, and the Nairobi Metropolitan Service has successfully completed construction on City Hallway, Moi Avenue, and Wabera Street (Thiong'o, 2021). Along Kenyatta Avenue, Wabera, and Muindi Mbingu Streets, NMS installed Non-Motorized Transport (NMT) infrastructure throughout its operational tenure. All of these streets have since undergone renovations, including the installation of bike and pedestrian lanes. When a new asphalt (bitumen) facility on Kangundo Road opens in September 2020, NMS plans to speed up road repairs in Nairobi were revealed. With a daily output of 2,400 tonnes of bitumen, this plant can resurface three kilometers of road. On the other

hand, the Industrial Area's former reliance on asphalt from a factory on Nanyuki Road produced just 150 to 300 tonnes of asphalt per day (Omondi & Kinoti, 2020). This study will specifically delve into the 176 completed road construction projects in the Nairobi Metropolitan Area as overseen by the Kenya Rural Roads Authority (KeRRA) (Appendix II).

The study of road construction projects in Nairobi City County is justified by several critical factors. Nairobi is Kenya's capital and a major economic hub, hosting numerous national and international businesses. The efficiency and quality of its infrastructure, particularly road networks, are vital for economic activities, including transportation of goods and services, commuting, and overall connectivity within and beyond the county. Given its strategic importance, any deficiencies in road construction projects in Nairobi City County have far-reaching implications for the region's economic growth and development. Nairobi City County faces unique challenges in road construction, including rapid urbanization, high population density, and significant traffic congestion. These factors exacerbate the complexities of road construction projects, making it essential to understand the specific macro-environmental and stakeholder-related dynamics that impact project performance. Addressing these issues through targeted research can lead to improved project outcomes, ensuring that road infrastructure meets the needs of its users efficiently and sustainably.

Several issues of concern regarding completed road construction projects in Nairobi City County necessitate a scientific inquiry. These issues are raised by various stakeholders, including the general public, government authorities, contractors, and road users. The nature of the complaints often revolves around project delays, cost overruns, poor quality of construction, and inadequate maintenance. One of the most significant concerns is the frequent delays in completing road construction projects. These delays cause inconvenience to road users, disrupt traffic flow, and lead to economic losses due to increased travel times and fuel consumption. Government authorities and the public often complain about the extended timelines that hinder the timely realization of infrastructure benefits. Another critical issue is the escalation of project costs beyond the initial budget estimates. Cost overruns strain public finances and result in inefficient allocation of resources. This issue is

frequently raised by government bodies responsible for budget oversight and funding allocation.

Complaints about substandard construction quality are common. Issues such as potholes, poor drainage, and rapid deterioration of road surfaces are highlighted by road users and maintenance crews. These problems lead to increased maintenance costs and reduced road lifespan. There are also concerns about the lack of regular and effective maintenance of completed road projects. Inadequate maintenance results in faster degradation of road infrastructure, leading to higher repair costs and safety hazards for road users. Both the public and maintenance authorities express dissatisfaction with the maintenance practices.

If these issues are not resolved, the consequences will be significant and multifaceted. The public will continue to experience inconvenience, longer travel times, and higher transportation costs. Government authorities will face increased financial burdens due to cost overruns and frequent repairs, diverting funds from other essential services and development projects. Contractors may face reputational damage and legal disputes, impacting their ability to secure future projects. Moreover, the overall economic development of Nairobi City County will be hampered. Poor road infrastructure affects businesses that rely on efficient transportation for their operations, leading to decreased productivity and competitiveness. This, in turn, can deter investment and economic growth in the region.

The practical problem justifying the need for this applied research lies in the urgent requirement to enhance the performance of road construction projects in Nairobi City County. By investigating the macro-environmental factors and stakeholder participation that influence project outcomes, this research intends to develop actionable insights and recommendations to address the identified issues. The research aims at establishing a scientific foundation for enhancing project planning, implementation, and oversight, guaranteeing that road infrastructure projects are finished promptly, within the allocated funds, and to the utmost standards of quality. Ultimately, this research will contribute to more effective and efficient road

construction practices, benefiting all stakeholders involved and supporting the economic growth and development of Nairobi City County.

1.1.3 Project Macro Environment

The macro (remote) environment encompasses political, socio-cultural, economic, ecological, and technological aspects (Flyvbjerg et al., 2019). These factors are asserted to have a long-term impact on a company's activities. The macro environment consists of broad environmental factors that significantly affect almost all organizations. The influence of macro-environmental factors on organizations is classified using PESTEL, aligning with the arguments of Assaad, El-Adaway, and Abotaleb (2020). The macro environment plays a pivotal role in determining the success or failure of an organization's strategies, with the effects of these general factors becoming apparent in the immediate environment through changes in competitive forces (Barkauskas, Barkauskienė & Jasinskas, 2020). This current study used socio-cultural, economic, technological, and political factors as macro environment measures.

Economic factors encompass issues related to inflation, interest rates, per capita income, and labor costs, among others (Wambui & Kisimbii, 2020). The exchange rate of a currency also proves to be a significant determinant, as it translates into increased or decreased operational costs when converting currencies for payment or other services. Improved living standards lead to increased product demand, presenting numerous business opportunities where profits are concerned. The constantly changing business environment, marked by volatile access to credit, unpredictable labor costs, and heightened competition, significantly influences organizational performance (Kitonyi, Kibera, Gathungu & Yabs, 2020).

Ahmed (2021) asserts that economic variables that affect foreign currency rates, inflation rates, and interest rates have a significant effect on how any organization develops. Moses (2019) highlights the close relationship between revenue growth and an organization's performance and growth. The global market is heavily influenced by factors such as national taxes, changes in interest rates, labor costs, prices of raw materials and currencies, economic cycles, stock market values, GDP numbers, and inflation (Ogutu & Muturi, 2017). When evaluating enterprises in a

nation, it is imperative to take these economic variables into account, especially the magnitude of indicators such as GDP. In smaller markets, entry techniques with low break-even sales volumes—like indirect exporting—are preferred, particularly when industries focus on niche markets. In order to access national markets, agreements with local distribution channels must be established. For smaller businesses, exporting can be challenging and expensive due to logistical issues including paperwork, shipment plans, and other issues. Consideration should be given to elements including the requirement for local sales teams and services, the duration of transportation, and complex price and performance changes, especially in light of top management traits.

Products can get expensive, especially if they are high-value or need to be delivered quickly. Economic factor analysis shows that, in the context of general economic growth, variables like labor costs, organizational effectiveness, and the availability of credit and finance attract support from a variety of state sectors (Olawale & Sun, 2018). According to Aguilla-Escobar and Garrido-Vega (2016), the overall state of the economy has a substantial impact on every industry, including wholesale and retail, suppliers, manufacturers, government, and non-governmental organizations. Businesses evaluate the state of the economy using a range of basic economic indicators, such as the consumer price index, net disposable income, GDP, interest rates, and unemployment rates. According to Hassan (2017), different market segments influence consumption patterns, thus it's critical for any business to take both global and domestic economic trends into account.

In their study on financial product purchase modeling, Opawole et al. (2019) concluded that individual qualities and economic considerations are crucial in influencing consumers' purchasing decisions. They go on to say that marketing teams should target products carefully in a down economy because only particular segments are likely to make purchases. In general, Tang et al.(2021) propose that the interplay between socio-demographic and economic characteristics is crucial in enhancing client targeting or segmentation, furnishing predictive buy rankings, and yielding precise forecasts of forthcoming purchases.

Social-cultural variations between areas include things like language, religion, way of life, values, preferences, and actions. Organizations need to be aware of the nuances of the cross-cultural environment, including how different cultures might influence regional traditions and how a company's strategy can most effectively represent this variety. These sociocultural and demographic differences have a big impact on customer reactions to different marketing tactics, stakeholder decision-making processes, and purchasing habits (Owuze, 2018). When overseeing building projects, issues pertaining to the relationship between individuals and the community, religion, lifestyle choices, community attitudes, and gender roles are all important factors to take into account. According to Galyna, Maria, and Nataliya (2019), paying attention to these elements may be the difference between success and failure.

According to Ahmed, Mohamed, and Ahmed (2022), socio-cultural factors shape societal views, values, and lifestyle choices. They go into detail about how factors like the literacy rates in the area and cultural norms affect the outcome of a project. The cultural, sociological, personal, and psychological traits of the community where initiatives are placed have a big influence on their success. Project managers must take these elements into account when making decisions, even if they might not be within their control (Kirui & Moronge, 2016). According to Olawale and Sun (2018), a mix of internal and external elements influence a project's success. While internal elements include attitudes and beliefs, learning needs and motives, perception and values, and personality, external factors include economic, demographic, safety-focused, situational, social, and technological components.

This viewpoint is supported by Sang (2020), who claims that four important psychological factors—perception, motivation, beliefs and attitudes, and learning—have an impact on a project's success. People's inclinations to like or dislike things and to move toward or away from them are shaped by their attitudes, which are characterized as persistent feelings, assessments, and inclinations toward an idea or item. Creating target market strategies is a common step in creating a successful company plan. Market segmentation is thought to be essential to these strategies (Afande, 2021).

Another factor is the physical environment, which includes natural calamities like earthquakes, tornadoes, and floods as well as the availability of commodities like coal, oil, and minerals. Wide-ranging effects of climate change are seen in a number of businesses, including agriculture, tourism, and transportation. Businesses must take into account the effects of global warming and the growing emphasis on environmental protection, which are changing demand trends and creating new economic opportunities. According to Makoveyenko, Siden, and Pyliavskyi's (2020) article on the Express website, the UK has implemented prohibitions on gasoline and diesel cars as of 2040, and by 2020, toxin levies are expected to be implemented on the most polluting vehicles. Kenya is also thinking of raising the customs fees on used cars in order to safeguard and preserve the environment.

Institutions need to continuously adopt the newest technology developments in order to be competitive (Bezuhla & Bezuhla, 2020). A competitive advantage can be gained by construction enterprises by identifying possible technologies that can help them stay current and avoid technological obsolescence in the sector, as a result of the continuously expanding technology landscape that strongly influences institutional processes. The use of technology in projects is always growing, and it's important to realize that developments in this area eventually affect quality and costs while also encouraging creativity and boosting a nation's standing abroad. A more digital approach is being adopted by project procedures, which use automated construction applications at different phases of the project. New inventions are being made, and the availability of cutting-edge building supplies and techniques has increased significantly (Chaston, 2017).

According to Otieno and Waiganjo (2020), technological determinants include information availability, research and development, and the uptake of construction technology. By offering accurate and timely information, updating service systems, guaranteeing the right degree of quality, and putting other policies based on innovations and modified technology infrastructure into place, these elements help a business remain competitive. Rugenyi (2016) highlights that attaining institutional growth and sustainability requires the utilization of contemporary construction technologies and information systems.

The construction industry is impacted by a number of technological forces, such as the growing use of computer programs, sophisticated building materials and methods, trends in technological innovation and automation, quicker production speeds, smart systems, advancements in artificial intelligence, and diversification (Musyoka, Gakuu & Kyalo, 2017; Flyvbjerg et al., 2019). Rugenyi (2016) asserts that it is difficult for outside parties to compete with local products due to high transportation costs, particularly when there is a large distance between two countries. Infrastructure in industrialized nations, such as the US, Germany, and Sweden, is typically better than that in underdeveloped nations. Organizational and structural changes, as well as new construction technologies, are intrinsically tied to institutional success. Assaad, El-Adaway, and Abotaleb (2020) point out, while restructuring and enhancing any organization's information system and revenue collection marking system, it is essential to impart management and marketing skills to rural inhabitants and provide information for all stakeholders.

According to Gruden and Stare (2018), process digitization propels technology innovations that create new ways to deliver projects and improve the process as a whole. Diverse client segments possess disparate IT expectations and requirements, hence requiring discrete IT application types for every segment. A company needs a strong scientific-technological base in order to become technologically sophisticated, because new technologies quickly replace older ones. Either new IT applications should create entirely new markets or they should revolutionize already existing ones.

Sirisomboonsuk, Gu, Cao, and Burns (2018) looked at the connection between project performance, service practices, and IT sophistication. They concluded that IT sophistication moderates the relationship between service practices and performance. The relationship among performance, information technology, organizational structure, and strategic direction has also been the subject of much scholarly attention (Zorić, Makitan, Brtka, and Mrđen, 2021). Organizational executives are becoming increasingly concerned about information technology investments as a result of enterprises implementing construction technology in response to projected environmental changes. Memon et al. (2023) found that the

average firm views IT investments as a significant and value-enhancing activity. In his conclusion, Bergeron states that information technology must align with strategy, environment, and structure of a business.

The political-legal environment encompasses a number of elements, including political stability, strategic development objectives, government-managed institutional promotion, regulatory policies, government support, and the legal framework that directs an institution's functioning. The performance of construction enterprises is significantly hampered by legal and hierarchical bureaucratic restraints (Kigera, 2016). In general, legal documents encourage revenue collection efforts and improve performance; yet, in particular circumstances, they may be legally restricted (Barkauskas, Barkauskienė & Jasinskas, 2020).

Political forces that affect business performance are defined by Solis-Carcano, Corona-Suarez, and Garcia-Ibarra (2020). These forces include trade policies, embargoes and sanctions, wars and diplomatic relations, political events and trends, political instability, political meddling, and laws protecting the health and safety of consumers. Sectors impacting particular political goals, such employment, defense, and access to national resources, are likely to see political interference. Political considerations frequently have an effect on the entry strategy and productivity of construction enterprises in centrally planned communist countries. According to Akanni et al. (2022), supplier and customer interactions as well as government activities are essential components of the construction process. Depending on its nature and the local context, legislation may fall under the political or legal purview. It is frequently employed, particularly in developed nations, to restrict actions that have a detrimental impact on the environment. Stojcetovic et al. (2022) argue that optimal conditions for the development of institutions include political order, security, an effective legal system, and the provision of public goods such as infrastructure and environmental services by the state.

Business rules and operating costs are heavily influenced by the politics of a country or region. Changes in governmental leadership and adjustments to laws, rules, and policies are examples of political and legal influences (Lu et al., 2020). Businesses need to plan ahead for how these changes may affect their day-to-day operations.

The building industry as a whole has seen a rise in government control (Chileshe et al., 2022). Examining government involvement is also crucial, particularly in cases where host governments have limited the operational independence of multinational firms by restricting the use of resources and strategic autonomy.

The selection of the project macro-environment as a plausible explanation for the variation in the performance of road construction projects in Nairobi City County is justified by the significant and multi-faceted influence these factors exert on project outcomes. The macro-environmental factors encompass political, socio-cultural, economic, and technological aspects that shape the external context within which road construction projects operate. These factors are critical in determining project success or failure, as they affect resource availability, regulatory compliance, stakeholder expectations, and operational efficiency. Understanding how these external factors interact with project dynamics provides a comprehensive perspective on the challenges and opportunities faced by road construction projects in Nairobi City County.

While other factors, such as project management practices, organizational capabilities, and internal project controls, also influence project performance, the macro-environmental factors are particularly salient in the context of Nairobi City County. The unique socio-economic landscape, rapid urbanization, and political environment of Nairobi present distinct challenges that are not adequately addressed by focusing solely on internal project factors. By examining the macro-environment, this study aims to capture the broader context that significantly impacts project performance, providing insights that are crucial for formulating effective strategies to enhance project outcomes.

Other factors such as project management practices and organizational capabilities were not the primary focus of this study because they are often well-explored in existing literature. While these internal factors are undoubtedly important, they do not fully capture the external pressures and constraints imposed by the macro-environment, which are particularly relevant in the context of Nairobi City County. This research intends to address a gap in current research by prioritizing macro-

environment and providing a comprehensive understanding of the elements that impact road construction project performance.

1.1.4 Government Policies

Policy encompasses the plans, actions, and intentions of a system in achieving specific objectives (Opawole et al., 2019). Government policies target timeliness, objectivity, and the specifics of desired objectives. A structured approach to project implementation, including procurement and bidding processes, fiscal taxation policies, and environmental policies, is crucial for success (Assaad et al., 2020). According to Assaad, El-Adaway, and Abotaleb (2020), the project model under implementation should align with government rules and regulations in construction. Additionally, the mode of implementation plays a pivotal role in determining the willingness of new construction players to enter the market, the capital at risk, and the response to market demand (Jones, 2020). Hence, the mode of delivery significantly influences operational costs.

Government policy on road infrastructure projects includes the legislative framework, laws, norms, and regulations issued by the government or its agencies. These policies can either enhance or hinder the progress of road infrastructure projects (Kitonyi, Kibera, Gathungu & Yabs, 2020). For instance, the Kenya Roads Act of 2007 and its 2023 amendment established the institutional and legal framework for road management. This legislation also created the Kenya Rural Roads Authority (KERRA), Kenya Urban Roads Authority (KURA), and Kenya National Highways Authority (KENHA). KENHA is accountable for the building, renovation, upkeep, and administration of national roadways (Mujabi et al., 2020).

The government also released Sessional Paper No. 5 of 2019, which dealt with the development and management of the road subsector. The goal of the strategy was to strengthen the government budget allocation process for road maintenance, boost the efficacy of road maintenance operations, and strengthen the institutional and management framework (An, Razzaq, Nawaz, Noman & Khan, 2021). The legal and regulatory framework that a business operates inside is determined by political factors (Galyna, Maria & Nataliya, 2019).

Government policies serve a pivotal role in shaping the performance of road construction projects by influencing various aspects such as regulatory frameworks, funding mechanisms, and implementation strategies. As a mediator, government policies can bridge the gap between macro-environmental factors and project performance, ensuring that external influences are managed effectively to enhance project outcomes. Previous studies have extensively explored the role of government policies as a moderator in the context of project performance. For instance, Assaf and Al-Hejji (2019) investigated the impact of government regulations on construction project delays in Saudi Arabia, finding that stringent regulatory requirements often led to significant project delays. Similarly, Ika, Diallo, and Thuillier (2023) examined the influence of donor-imposed policies on project success in Africa, highlighting the moderating effect of these policies on project outcomes.

However, the literature reveals several contradictions and controversies regarding the effectiveness of government policies in enhancing project performance. For example, while some studies emphasize the positive impact of regulatory frameworks in ensuring quality and safety standards (Nguyen et al., 2018), others argue that excessive bureaucratic procedures can hinder project progress and increase costs (Flyvbjerg et al., 2019). Moreover, the one-size-fits-all approach of many policies often fails to account for the unique challenges and contexts of specific projects, leading to suboptimal outcomes.

Limitations of previous approaches include the reliance on generic policy recommendations that do not consider the specificities of local contexts. For instance, recommendations arising from studies in developed countries may not be directly relevant to developing countries owing to differences in infrastructure, economic conditions, and governance structures. This inappropriateness can lead to ineffective implementation and unintended consequences. In addressing these limitations, this study adopts a context-specific approach to examine the mediating role of government policies in the performance of road construction projects in Nairobi City County. By focusing on the unique regulatory, economic, and socio-political environment of Nairobi, the study aims to provide tailored

recommendations that are more likely to be effective in this context. In addition, the study utilized a mixed-methods methodology, which combines quantitative analysis with qualitative insights from key players, in order to comprehensively capture the complex effects of government policies.

This approach is expected to resolve the observed limitations and controversies by providing a nuanced understanding of how government policies can be designed and implemented to mediate the link between macro-environmental factors and project performance effectively. By addressing the specific challenges and leveraging the unique opportunities in Nairobi City County, the research aims to contribute to the development of more effective policy frameworks that enhance the performance of road construction projects.

1.1.5 Project Stakeholders' Involvement

Makoveyenko, Siden, and Pyliavskyi (2020) contend that stakeholders hold varying responsibilities and levels of influence on a project, underscoring the contractor's necessity to identify the appropriate stakeholders. According to Chaouk, Pagliari, and Moxon (2020), a project's ability to manage conflict and disagreements may face serious difficulties if the proper stakeholders are not identified. Stakeholders must be included in the analysis since they have the ability to influence a project in either a favorable or bad way. Negative stakeholders must be won over if feasible so as to increase the likelihood that a project will succeed. Undesirable stakeholders should not be ignored because doing so might be harmful to the project's success. Project managers have to make sure that every stakeholder's interest is taken into account and negotiate to fulfill the bare minimum of criteria.

According to San Santoso and Gallage (2019), a stakeholder is someone who is impacted by the decisions made by another party. They emphasize the need of including all stakeholders in project analysis. Stakeholders in road construction projects might include government organizations and the host community. Given the considerable environmental impact of such constructions and the disturbance of other infrastructure elements like electricity lines and water pipes, the researchers emphasize the significance of studying and taking stakeholder interests into

consideration for optimal project implementation. Managing these elements becomes imperative when stakeholders are involved.

A wide range of stakeholders, divided into internal and external groups, are involved in any normal project. Within the designated authority body, project officers, senior managers, and other employees are considered internal stakeholders in infrastructure projects. External stakeholders include the government, suppliers, customers, and contractors. Effective communication and coordination among these parties are essential for the smooth progression and high-quality outcome of a project. Failure to communicate effectively among stakeholders jeopardizes successful project completion. Various issues affecting multiple stakeholders make the execution of excellent projects challenging (Opawole, Jagboro, Kajimo-Shakantu & Olojede, 2019).

The study introduces the participation of project stakeholders as a mediating variable, recognizing its crucial influence on the success of road construction projects. The stakeholders involved in building projects encompass clients, contractors, consultants, suppliers, government agencies, and the community. Their participation is crucial in guaranteeing that the project achieves its goals, follows the designated timelines, remains within the allocated budget, and delivers the anticipated level of quality. The decision to include stakeholders' participation as a mediating variable is based on several compelling reasons.

Stakeholder participation guarantees that the varied interests and expectations of multiple stakeholders are considered, resulting in more knowledgeable decision-making and enhanced project outcomes. Effective stakeholder engagement can mitigate risks, enhance communication, foster collaboration, and build trust among all parties involved. This holistic approach is especially important in the complex and multifaceted nature of road construction projects. Further, while stakeholder participation has been comprehensively studied in the context of project management, its role as a mediating variable specifically in road construction projects remains underexplored. Existing studies primarily focus on direct relationships between stakeholder involvement and project success (Aaltonen & Kujala, 2020; Bourne & Walker, 2019), but there is limited empirical research on

how stakeholder participation mediates the connection between macro-environmental factors and project performance.

The few researches that do consider this mediation often highlight gaps and inconsistencies. For example, Yang, Wang, and Jin (2022) found that stakeholder engagement can enhance project performance, but their study did not delve deeply into the mechanisms through which this occurs. Additionally, Olander and Landin (2018) suggest that while stakeholder management is crucial, the methodologies for effectively integrating stakeholders into the project lifecycle are often inadequate. Unresolved questions in the current literature include how stakeholder participation influences the link between external macro-environmental aspects and the internal dynamics of project performance, what specific stakeholder engagement practices are most effective in the context of road construction projects, and how stakeholder involvement can be systematically integrated into the project management processes to maximize benefits.

The inadequacies in findings, conclusions, and recommendations from previous studies underscore the need for a more nuanced investigation. This study aimed to fill these gaps by providing empirical evidence on the mediating role of stakeholder participation in road construction projects in Nairobi County. By doing so, it seeks to advance knowledge on effective stakeholder management strategies that can be applied to enhance project outcomes. Incorporating stakeholder participation as a mediating variable helped uncover the indirect effects that macro-environmental factors have on project performance. It also provided insights into how stakeholder engagement can be optimized to navigate the complexities of the macro environment, hence enhancing the productivity and efficacy of road construction endeavors. Ultimately, this research contributed to developing best practices for managing stakeholders in the construction industry, particularly in the challenging context of Nairobi County.

1.2 Statement of the Problem

The advancement of road construction plays a crucial role in propelling economic development in Kenya, aligning with the objectives of Kenya Vision 2030.

Zhanglan, Awino, and Ogolla (2019) emphasize that these road construction projects need to adjust their designs to take into consideration the ever-changing environmental conditions. The Kenyan government has actively approved and carried out a number of infrastructure development projects, with an emphasis on the transportation industry. Within the Nairobi Metropolitan Area (NMA), there are 939.6 km of ongoing road building and maintenance projects; of these, 99.7 km of projects worth Kshs 4.3 billion were finished in 2021 (Kenya Roads Board, 2021).

Under the State Department of Infrastructure, a branch of the Ministry of Transport, Infrastructure, Housing, Urban Development, and Public Works (MoTIHUDPW), the Kenya Rural Roads Authority functions as a State Corporation. The Authority is in charge of creating, managing, and fixing Kenya's rural roads. However, a number of problems frequently prevent it from accomplishing its goals, including uneven resource distribution, inexperienced contractors, hold-ups in certification and payment of finished work, excessive project spending and cost increases, political meddling, subpar quality control, low contractor motivation, and elevated agency risks (World Bank, 2017). By the end of the 2020/2021 Financial Year, only 4208 km of bitumen grade roads had been constructed, with revised completion deadlines (KeRRA, 2021). The Authority had planned and purchased 8,841.6 km of bitumen-standard roads by 2020 (KeRRA, 2018). Due to claims for unused physical and human resources as well as interest on past-due payments, this delay has resulted in higher expenses. In order to implement a performance-based road maintenance (PBRM) strategy, the KeRRA's 2018–2022 Strategic Plan called for expanding the capacity for citizen contracting, hiring 12 supervision consultants by 2020, putting in place a Public Private Partnership Model to complete 700 km and 68 km by 2021, respectively, and issuing Infrastructure Bonds. However, the implementation of these strategies has not yet been finished.

The impact of stakeholders' actions on the macroenvironmental functioning of road development projects in the Nairobi Metropolitan Area remains unclear despite their existence. Stakeholders are expected to influence top management of the project and help mitigate risks resulting from the macroenvironment. This indicates flaws that necessitate more investigation into the connection between these variables (Mwangi,

2020). Operating halts have occasionally occurred for developers during construction because of a variety of obstacles, including shifting water pipes, power cables, and vendors who had set up business along the route. Take the 9.8-kilometer Ngong Road as an example, where uneven construction resulted in project termination halfway through. KeRRA had to start over in order to overcome engineering obstacles on the same road, such as sharp lane ends, landscaping, and road markers. Over time, the sector's growth has been hampered by safety issues like theft and vandalism of infrastructure equipment, such as fiber cables, power lines, and gasoline. Tribal conflict has also caused a number of significant road projects to be postponed. The Lironi-Mau Summit Expressway is one example of a road project that has been delayed due to the enormous amount of capital needed for design and construction. If this issue is not resolved, it will be challenging for devolved governments to achieve sufficient and noteworthy growth.

Several practical problems affect road construction projects in Nairobi City County. These problems include frequent delays, cost overruns, poor quality of construction, and inadequate maintenance. These issues affect various stakeholders, including the general public, government authorities, contractors, and road users, who have expressed dissatisfaction with the current state of road infrastructure in Nairobi. Project delays cause significant inconvenience to road users, disrupt traffic flow, and lead to economic losses due to increased travel times and fuel consumption. Cost overruns strain public finances and result in inefficient allocation of resources. Substandard construction quality, characterized by the presence of potholes and inadequate drainage, results in escalated maintenance expenses and diminishes the longevity of the roads. Inadequate maintenance results in faster degradation of road infrastructure, posing safety hazards and increasing repair costs.

Previous researches have explored the impact of macro-environmental factors on construction project performance. For instance, in Kilifi County, Kenya, Wambui and Kisimbii (2020) looked into the ways in which social-cultural factors influenced the effectiveness of community-based programs. Maina and Gathenya (2022) investigated the impact of economic determinants on the project management performance of petroleum marketing enterprises in Kenya, whereas Owuze (2018)

investigated the relationship between the sociocultural environment and the performance of manufacturing organizations in Nigeria. Kigera (2016) looked at the impact of political issues on the performance of international hotel chains in Nairobi, Kenya, while Musyoka, Gakuu, and Kyalo (2017) explored the impact of technological components on the success of gated community housing complexes in Nairobi County, Kenya. These studies, however, have several flaws, including a disregard for location, methodology, road construction projects, and performance metrics.

This study addresses these gaps by focusing on the Nairobi context, employing a comprehensive approach that includes both moderator (government policies) and mediator (stakeholder participation) variables, and unpacking the indicators of the macro-environmental factors in detail. This study seeks to analyze the macro-environmental elements and stakeholder involvement that impact project results. Its objective is to generate practical insights and solutions for addressing the identified difficulties. The research aims to establish a scientific foundation for enhancing project planning, implementation, and oversight, with the goal of ensuring timely completion, adherence to budgetary constraints, and adherence to the highest standards of quality in road infrastructure projects.

The practical problem justifying the need for this applied research lies in the urgent requirement to enhance the performance of road construction projects in Nairobi City County. If these issues are not resolved, the consequences will be significant and multifaceted. The public will continue to experience inconvenience, longer travel times, and higher transportation costs. Government authorities will face increased financial burdens due to cost overruns and frequent repairs, diverting funds from other essential services and development projects. Contractors may face reputational damage and legal disputes, impacting their ability to secure future projects. Moreover, the overall economic development of Nairobi City County will be hampered. Poor road infrastructure affects businesses that rely on efficient transportation for their operations, leading to decreased productivity and competitiveness. This, in turn, can deter investment and economic growth in the region.

By studying the moderator and mediator variables, this research is expected to make substantial contributions to both knowledge and policy. The study aims to enhance comprehension regarding the macro-environmental factors, mediated by stakeholder participation and moderated by government policies, impact road construction project performance. This nuanced insight can inform future research and theoretical development in project management. Additionally, the findings will offer practical recommendations for policymakers to design effective strategies that address the identified issues. For instance, improving regulatory frameworks and enhancing stakeholder engagement practices can lead to better project outcomes. These insights will be valuable for government authorities, contractors, & more parties engaged in road construction projects.

1.3 Objectives of the Study

1.3.1 The General Objective

The study sought to determine the relationship between macro environment and the performance of roads construction projects in Nairobi City County, Kenya.

1.3.2 The Specific Objectives

The study sought:

i. To ascertain the connection between social-cultural factors and the performance of roads construction projects in Nairobi City County, Kenya.
ii. To analyze the connection between economic factors and the performance of roads construction projects in Nairobi City County, Kenya
iii. To investigate the connection between technological factors and performance of roads construction projects in Nairobi City County, Kenya
iv. To examine the connection between the political factors and the performance of roads construction projects in Nairobi City County, Kenya
v. To assess the moderating effect of government policies on the connection between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya.

vi. To evaluate the mediating effect of project stakeholders' involvement on the relationship between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya.

1.4 Hypotheses

This research was guided by the following hypotheses:

H_{01}: There is no significant relationship between social-cultural factors and the performance of Roads construction projects in Nairobi City County, Kenya.

H_{02}: There is no significant relationship between economic factors and the performance of Roads construction projects in Nairobi City County, Kenya.

H_{03}: There is no significant relationship between technological factors and the performance Roads construction projects in Nairobi City County, Kenya.

H_{04}: There is no significant relationship between political factors and the performance of roads construction projects in Nairobi City County, Kenya.

H_{05}: Government policies have no moderating effect on the relationship between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya.

H_{06}: The project stakeholders' involvement has no mediating effect on the relationship between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya.

1.5 Significance of the Study

Because NMA has more valuable roads than any other area—a road that is primarily related to the existence of high-net-worth continuing projects like the Nairobi Expressway project—it was chosen as the study location. The study's findings would benefit Kenya's County and National Governments by assisting in the identification of macroenvironmental elements that affect the execution and effectiveness of road development projects. Policymakers in the public sector may use these findings to create procedures that would ensure that road construction projects under their purview are carried out successfully. The results would also inform sector working groups, local communities, and civil society about their roles in fostering an atmosphere that will draw private investment in development initiatives, such as building roads, which will ultimately result in the creation of jobs.

Civil society would benefit by gaining effective planning insights before initiating projects, understanding the extent to which environmental factors influence road construction project performance, and developing strategies to enhance project outcomes. Road construction companies or contractors could leverage the study's findings to identify challenges and apply strategies for achieving efficiency and effectiveness in their projects. Additionally, project stakeholders would benefit from increased project management knowledge, ensuring their involvement in decision-making that addresses project challenges while serving their interests.

Construction professionals, including architects, engineers, quantity surveyors, construction project managers, and site agents, would enhance the success of construction projects by managing relevant factors effectively. Project developers and clients could apply the study's findings to achieve greater success in their construction projects by mitigating risk factors. Project managers and contractors would gain insights into managerial practices leading to the efficient completion of road infrastructure projects, ensuring that the constructed roads meet desired standards.

The study's findings would contribute to existing knowledge, serving researchers and academicians seeking to explore and conduct further investigations in this field. The study would offer background information to research organizations and scholars interested in delving deeper into this area, facilitating individual researchers in identifying gaps in current research and conducting further studies.

This research provides empirical evidence that supports and expands the Systems theory, highlighting the critical role of external macroenvironmental factors in project performance. The inclusion of stakeholder engagement as a mediating variable is consistent with Stakeholder Theory, which highlights the significance of effectively managing stakeholder relationships to attain organizational success. This inclusion also enhances our comprehension of this theory within the precise context of road construction projects.

Additionally, the study contributes to Upper Echelons Theory by exploring how top management's decisions, influenced by macroenvironmental conditions and

stakeholder interactions, affect project performance, demonstrating the practical implications of strategic choices in response to external factors. Lastly, the study's examination of the moderating role of government policies aligns with Contingency Theory, which asserts that management strategies should be contingent on various internal and external factors, providing valuable insights that extend the theoretical framework of Contingency Theory.

1.6 Scope of the Study

The performance of road construction projects in Nairobi City County, Kenya, was examined in connection to the macroenvironment in this study. Nairobi City County in this sense includes Nairobi, Kiambu, Kajiado, Machakos, and Murang'a, the five counties that make up the Nairobi Metropolitan Area. The macroenvironmental variables that were examined included political, technological, social-cultural, and economic aspects. In order to examine the moderating and mediating effects of government policies and stakeholder involvement, the link between macroenvironmental conditions and the success of road construction projects in Nairobi City County was examined. The study focused on 176 completed road construction projects in the Nairobi Metropolitan Area that were managed by the Kenya Rural Roads Authority (KeRRA). Because KeRRA was seen as having the capacity to serve the national development strategy, it was selected for its road construction projects; hence, a causality study was required. It was crucial to assess the correlation between the macroenvironment and the performance of KeRRA's road construction projects in order to understand the challenges the Authority faced and to ensure the effective and efficient implementation of the National Development Agenda. The study's target population consisted of the 176 completed road development projects that KeRRA had worked on in the Nairobi Metropolitan Area. Along with road engineers, project planners, and directors, other units of observation included contractors, inspectors, surveyors, road supervisors, and members of project implementation teams (KeRRA). The analysis unit was Nairobi City County's completed road development projects. The research time scope covered the period from 2016 to 2021. This period was selected to capture recent projects and to provide a wide-ranging analysis of the performance trends and the impact of macroenvironmental factors over a significant timeframe

1.7 Limitations of the Study

The individuals selected for this study displayed hesitancy in volunteering information, potentially because they were worried that the collected data could be employed to intimidate them or potray a poor portrayal. In order to address this issue, the researcher sent an introductory letter from the University, guaranteeing participants that any information they submitted would be handled with confidentiality and applied exclusively for educational reasons. Furthermore, the findings of this study were contingent on the respondents' willingness to provide accurate, objective, and reliable information. The researcher implemented measures to verify consistency and assess the reliability of the collected data. There were challenges related to materials during the study, prompting the adoption of a smaller sample size and confining the focus to road projects involving a single civil society.

Additionally, this study concentrated solely on roads construction projects in Nairobi City County, which might constrain its applicability to roads in other regions worldwide. The study faced limitations in data collection due to the busy schedules of the selected target population. To overcome this challenge, the researcher administered some questionnaires online when feasible and enlisted research assistants for the physical distribution of questionnaires.

1.8 Organization of the Study

This study is structured into five chapters. First chapter includes the study's background, problem statement, objectives, research questions, scope, confines, and the organization of the study. Chapter two incorporates the literature review, theoretical framework, conceptual framework, and relevant areas of study related to the researcher's topic. Chapter three details the research methodology, research designs, target population, sampling techniques, research instruments, data collection procedures, data analysis, and ethical concerns. Chapter four presents the

research findings outlined in the research methodology. The final chapter, Chapter five, comprises discussions, conclusions, and recommendations for the project.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter delves into the theories that underpin this study. It encompasses empirical literature reviews that explore the connection between macro environment factors, government policies, stakeholders' involvement, and the performance of roads construction projects. Additionally, the chapter provides a summary of the literature, highlights research gaps, and outlines the conceptual framework guiding the research.

2.2 Theoretical Literature Review

This section provides an overview of the pertinent theories applicable to the study. The key foundation of the study is the Systems theory, complemented by Stakeholder Theory, Upper Echelons theory, and Contingency Theory.

2.2.1 Systems Theory

Ludwig von Bertanlanffy first proposed the Systems Theory in 1956. It depicts a system in which each part is interconnected with all other elements and depends on these relationships to function. To maintain a competitive edge, organizations must either strategically align with their environment or adapt to it. According to Roth (2019), an organization is a system that has clear boundaries separating it from its surroundings. This builds on the initial viewpoint. Businesses operating in the global business environment face a variety of challenges in the social, technological, political, legal, and economic spheres. These challenges affect the businesses' capacity to obtain the instruments and tactics needed to endure and enhance performance via adaptation.

Scott (2019) asserts that macroenvironmental factors are uncontrollable and exist outside of an organization's physical walls. Although these factors are unpredictable and unstable, they also provide resources that are essential for an organization to thrive. Because of this, businesses must engage in strategic risk management to reduce the impact of environmental uncertainties and maximize the resources available to them in order to survive. Pressures from the political, economic, social, technological, and legal domains shape the environments in which organizations

function (Van Assche, Verschraegen, Valentinov & Gruezmacher, 2019). This suggests that senior managers should always take environmental hazards into account when making strategic decisions because they are influenced by the macroenvironment while developing strategies.

Open systems theorists contend that an organization's ability to survive depends on how it interacts with its surroundings. Nevertheless, opponents of the open systems approach argue that while powerful firms can impact the environment in which they function, organizations are more stable when they are separated (Fernandes, Camerino, Garganta, Pereira & Barreira, 2019). In addition, the theory has been criticism for neglecting to adopt an integrated, interactional strategy that utilizes many approaches for resource reliance, leaving a great deal of information regarding the interplay between various strategic management techniques unknown. This highlights how crucial it is to look into different resource dependencies, like the impact of different strategic alliances and organizational leadership (Van Assche et al., 2019).

The systems theory clarifies how many environmental factors interact with road development projects in Nairobi City County by including all aspects of the project's macro-environment. As a result, the theory is applicable to our research and offers an explanation for how the macroenvironment affects how well road construction projects in Nairobi City County operate.

2.2.2 Stakeholder Theory

Freeman (1984) initially postulated the Stakeholder Theory, which posits that a firm comprises various stakeholders, and its primary objective is to fulfill their well-being, needs, and perspectives. This implies that each stakeholder in the firm has a unique relationship and decides independently whether to associate with the firm. The theory states that a given stakeholder's level of satisfaction may be influenced by the activities of other stakeholders within the firm. However, each stakeholder has their own expectations for satisfaction. As a result, the theory contends that the degree of satisfaction and the degree to which expectations are met impact each

stakeholder's choice to engage with the business as well as their actions within that engagement.

Stakeholder Theory's primary objective is to assist managers in comprehending and successfully managing stakeholders. It draws attention to the link between the organization's long-term survival and how stakeholders are handled. Despite its strategic management roots, the theory has been applied in numerous sectors, highlighting the importance of the relationship between top management and stakeholders. Managers ought to be aware that the participation of different stakeholders significantly impacts the outcome of a project. Stakeholders communicate based on the trust they establish with senior project managers, as opposed to having subordinates speak on their behalf.

Critics of the theory, such as Manowong and Ogunlana (2020), argue that it is difficult to operationalize for scientific investigation due to its lack of specificity. It is also criticized for not providing enough guidance when making decisions, especially when it comes to minimizing conflicts of interest that result from attending to different stakeholder requirements. Despite these concerns, the theory has been essential in emphasizing the need for corporations to consider stakeholder interests when making decisions. Stakeholder Theory has been criticized for being overly simplistic, failing to take into account the heterogeneity and variations in salience and impact across stakeholders, which can have a variety of effects on the organization (Freeman, Dmytriyev & Phillips, 2021).

Stakeholder Theory, which originated in strategic management, has been applied in several disciplines and encompasses different aspects such as concepts, approaches, types of data, and criteria for assessment. With the concept of stakeholders gaining increasing traction, a variety of opinions on the subject have emerged. This theory highlights how crucial it is for senior management to maintain relationships with stakeholders and how a project's success is greatly impacted by the involvement of many stakeholders. Moses (2019) asserts that a company's choices have the potential to either avert harm to the community or provide advantages, contingent upon the manner in which community interests are identified and investigated. These

decisions could involve abiding by the rules of the game, keeping commitments, or responding to complaints and demands made of the business.

The Stakeholder Theory provides a framework for assessing the dependent variable in this research, which is project performance. The many stakeholders expect independent regulatory authorities to execute to a high standard. While profits are an important output and shareholders are significant stakeholders, they are not always the main focus. While shareholders' interests may direct managers' actions, other significant stakeholders' concerns must also be considered. Thus, this theory lends support to the goal of investigating how project stakeholders' involvement mediates the conection between macroenvironmental factors and the performance of road construction projects in Nairobi City County, Kenya.

By focusing on the mediating effect of stakeholder involvement, this study leverages Stakeholder Theory to explore how different stakeholders' engagement influences the overall project outcomes. This perspective is crucial in understanding the dynamics between external macroenvironmental factors and project performance, providing a comprehensive view of how effective stakeholder management can lead to better project execution and success.

2.2.3 Upper Echelons' Theory

This Theory, postulated by Hambrick and Mason (1984), asserts that the characteristics of top management teams (TMTs) significantly influence organizational outcomes. The theory suggests that the backgrounds, experiences, values, and personalities of executives influence how they interpret information and make decisions. These decisions, in turn, have an impact on the strategic direction and performance of their enterprises (Hambrick & Mason, 1984; Bassyouny, Abdelfattah & Tao, 2020). According to cognitive psychologists supporting this theory, the cognitive bases and values of TMTs are crucial in understanding their behavior during the strategic management process. Neely Jr., Lovelace, Cowen, and Hiller (2020) also emphasize the correlation between TMT characteristics and corporate performance, highlighting the impact of top executives' personal attributes on decision-making processes and their perceptions of work-related events.

In this study, the theory is utilized to examine how government policies affect the performance of road construction projects. The theory suggests that the values and characteristics of individuals in top management positions within government agencies can significantly influence how policies are formulated and implemented, thereby affecting project outcomes. However, the theory has faced criticism due to its emphasis on descriptive rather than explanatory causality, meaning it describes the relationship between TMT characteristics and organizational outcomes without fully explaining the underlying mechanisms (Abatecola & Cristofaro, 2020).

Despite these criticisms, the theory provides a valuable framework for understanding the moderating effect of government policies on the connection between macroenvironmental factors and the performance of road construction projects in Nairobi City County, Kenya. By considering the influence of top executives' characteristics on policy formulation and implementation, this theory complements the Systems Theory and Contingency Theory in explaining the complex dynamics at play. Specifically, it helps to conceptualize how the values and cognitive frameworks of government officials can moderate the impact of political, economic, social-cultural, and technological factors on project outcomes.

This theoretical perspective is highly pertinent to the aim of this study, which aims to explore the moderating effect of government policies on the connection between macroenvironmental factors and the performance of road construction projects. Understanding how top management's characteristics influence policy effectiveness provides deeper insights into how to enhance project outcomes in the Nairobi City County context. This study, therefore, extends the theory by applying it to the public sector and examining its implications for infrastructure development, contributing to a more thorough comprehension of the elements that drive successful road construction projects in the region.

2.2.4 Contingency Theory

The contingency theory, introduced by Fiedler (1964), posits that organizational performance results from the alignment of various factors, including leadership, people, structure, technology, strategy, and culture. Advocates of the theory argue

that there is no universally optimal way to manage organizations and propose that the appropriate organizational structure and management style depend on a set of contingency factors shaped by the uncertainty and instability of their operating environments (Araral, 2020).

Despite its advantages, the contingency perspective has come under fire for failing to sufficiently address organizational endogeneity factors, notably the part senior management plays in assessing the influence on the environment (Kundu & Mondal, 2019). Another criticism leveled at the theory is its assumption that performance and the macroenvironment always have a positive relationship. Notwithstanding these objections, Safari and Saleh (2020) contend that the theory's claims need additional empirical research and that future studies should focus on the macroenvironment, its constituent parts, and enhanced conceptualization.

Moreover, in order to maintain alignment and stop performance loss, organizations are formed by contingencies. According to Kundu and Mondal (2019), contingency theory is performance-oriented and concentrates on the environment, which includes both internal and external contingencies. They highlight the fundamental idea of contingency theory, which promotes appropriate coordination between organizational components on the inside and outside in order to enhance organizational performance. According to the notion, companies' main policies should be in line with their missions, visions, and the external environment. It argues that depending on the situation, various strategic decisions and actions might be most beneficial. Contingency theory states that adapting to conditional situations within the company, such as senior management composition and strategy responses to external events, enables successful risk management (Kaplan & Mike, 2022). As a result, organizational performance is enhanced. When conceiving government policy, the organization applied contingency theory as a basic strategic management strategy to enhance road construction projects in Nairobi City County. It underpinned the investigation of the moderating effect of government policies on the connection between macro-environmental factors and the performance of roads construction projects in Nairobi City County, Kenya.

2.2.5 Summary of Theoretical Review

This section offers a comprehensive summary of the pertinent theories applicable to the study, which includes Open Systems Theory, Stakeholder Theory, Upper Echelons Theory, and Contingency Theory. These theories collectively offer a comprehensive framework for understanding the dynamics between macro-environmental factors, stakeholder involvement, Government policies and the performance of road construction projects.

The theoretical review establishes a robust basis for the empirical investigation of the relationships between macro-environmental factors, stakeholder involvement, government policies, and the performance of road construction projects. Open Systems Theory informs the need to consider the broad environmental context in which these projects operate. Stakeholder Theory emphasizes the importance of involving various stakeholders to ensure project success. Upper Echelons Theory highlights the influence of top management individualities on policy effectiveness, and Contingency Theory underscores the necessity of aligning strategies with environmental contingencies. These theoretical insights will guide the empirical analysis, helping to identify the key factors and mechanisms that drive the success of road construction projects in Nairobi City County.

2.3 Empirical Literature Review

An empirical examination seeks to provide an accurate description of the interaction between the instrument and the observed entity. This paper conducts an empirical review focusing on the impact of the macro environment and stakeholders on the performance of roads construction projects. The examined constructs encompass social-cultural attributes, economic factors, technological factors, political factors, government policies, and project stakeholders' involvement, exploring their influence on project performance.

2.3.1 Socio-Cultural Factors and Performance of Roads Construction Projects

In Kilifi County, Wambui and Kisimbii (2020) investigated how social-cultural elements affected the effectiveness of community-based initiatives. With a population

of 50,050, the research examined 285 projects in Kaloleni Ward, focusing on cultural beliefs, social divisions, community governance, and community resources. A descriptive survey design was employed in this study. Both descriptive and inferential statistics were used to analyze quantitative data; regression analysis was used for inferential data analysis. The results of the study showed that cultural belief systems had a major impact on how well community-based initiatives in Kilifi County performed. Various factors, including unemployment rates, religious and age divisions, ethnic profiling, infrastructure disparities, and gender divisions, also exhibited significant influence. Power dynamics within the community were found to moderately influence project performance, and human capital demonstrated a moderate influence as well. Ultimately, performance was determined to be most affected by the organizational cultural belief approach, and least affected by community resources. The techniques for social division and community governance came next. This study's noteworthy emphasis on community-based initiatives produced a conceptual gap when compared to the body of research already available on road construction projects.

Owuze (2018) used a correlational research approach to investigate the sociocultural environment and performance of industrial enterprises in Nigeria so as to ascertain the link between the variables. The study was conducted in each of the six geopolitical sectors of the country using a methodical questionnaire. The findings demonstrated a strong negative correlation between performance and alterations in societal attitudes, consumerism, values, and norms, as well as a strong negative correlation between performance and changes in societal lifestyle. Moreover, a significant negative link was found between the performance of the industrial enterprises and authority relationships. The paper suggests that manufacturing organizations seeking to increase productivity had to understand the interplay between socio-cultural and environmental factors. Nonetheless, the study's contextual gap in its applicability to other locations was presented by its geographical concentration on Nigeria.

An empirical analysis was carried out by Mobegi, James, and Sang (2020) to ascertain the effects of social-cultural characteristics on the effectiveness of donor-

funded health programs in Kenya. These attributes included local community literacy levels, Community support levels, language, and corruption levels. Their investigation showed that in addition to quality problems, time and expense overruns were common problems for many donor-funded health programs in Kenya. 69 donor-funded health projects that were active during the study period and started between 2018 and 2018 were the subject of the investigation. Because of the tiny population size, a census study was selected for its effectiveness, representativeness, dependability, and adaptability. The efficacy of donor-funded health programs in Kenya was positively correlated with language, literacy rates, and community support in the local areas, according to the study's regression results, which used explanatory and descriptive research methods. However, there was a negative relationship between the success of the initiative and the extent of corruption. It is crucial to remember that the study was limited to health initiatives supported by donors, which is very different from the current study's focus on road construction projects.

Masovic (2018) examined the notions of socio-cultural factors and the performance of multinational firms using an empirical review approach. The research discovered that it is challenging to ascertain the precise influence of each aspect on the operations of multinational firms due to their complex relationships. Sociocultural components have been identified as important environmental factors that impact the performance and economic activities of multinational corporations. Crucially, the management of foreign subsidiaries were acknowledged to have little control over these circumstances. The study relied on secondary data, distinguishing it from the quantitative approach adopted in the current study, thus introducing a methodological gap.

2.3.2 Economic Factors and Performance of Roads Construction Projects

The study conducted by Mobegi, Sang, and James (2019) researched the influence of economic variables, particularly alterations in tax, interest, and currency rates, on the efficacy of health programs sponsored by donors in Kenya. The research designs used in the study were explanatory and descriptive, with a foundation in the theory of limitations. All sixty-nine donor-funded health projects that were ongoing during the

study period and that had been started between 2018 and 2018 were included in a thorough census. The managers of donor-funded health programs and the leaders of donor-funded initiatives at the Ministry of Health were surveyed using semi-structured questionnaires. The data analysis and presentation process used both descriptive and inferential statistics, and a multiple regression model was utilized to elucidate the influence of economic factors on project success. The study discovered that a number of economic factors significantly impacted the performance of health projects supported by donors. The study's limitation to health projects—as opposed to the current research's focus on road construction projects—must be noted in order to avoid conceptual gaps.

Maina and Gathenya (2022) used a descriptive research design to examine how economic factors affected the project management effectiveness of Kenyan petroleum marketing companies. To administer the survey, drop-and-pick techniques were utilized. The quantitative data were analyzed using descriptive statistics in SPSS, and the results were then displayed visually with bar charts, graphs, and pie charts, as well as words like percentages, means, standard deviations, and frequencies. The study's conclusions show that petroleum marketing companies struggled with project management, which was typically attributed to a number of economic factors. Among these were foreign exchange rates, government assistance, collaborative ventures, and foreign investments. There is a methodological gap introduced by the fact that, in contrast to the current study, this one did not use a mixed research design.

2.3.3 Technological Factors and Performance of Roads Construction Projects

Musyoka, Gakuu, and Kyalo (2017) conducted an assessment of the impact of technological factors on the performance of gated community housing projects in Nairobi County, Kenya. The study encompassed all active gated community housing projects initiated between 2019 and 2022. Descriptive statistics revealed that respondents acknowledged, to a very great extent, the utilization of locally made plant and equipment in their projects. Additionally, there was a consensus that skills for operating the plant and equipment were readily available, along with team members possessing the necessary skills for effective operation. The study further

indicated a high level of satisfaction with the use of advanced construction information and communication technology (ICT), computer-aided drafting (CAD), 3D visual illustrations (Building Information Modelling), and electronic mails for communication. The results suggested that the adopted technological infrastructure had a moderately strong influence on the performance of gated community housing projects. Moreover, the technology environment demonstrated a statistically significant influence on project performance. It is noteworthy that while the study concentrated on the construction industry, it did not specifically address roads construction projects.

Zorić, Makitan, Brtka, and Mrđen (2021) explored the contribution of modern technologies to the success of IT projects. Employing a Quantitative Mono Method, the research examined the application of modern technologies in project management within the IT sector of Serbia. It assessed the extent to which experts believed that technology incentives positively impacted project success by analyzing their influence on success factors. However, it is important to highlight that this study did not center on the macro-environmental aspect, which is a focal point of the current study.

2.3.4 Political Factors and Performance of Roads Construction Projects

Kigera (2016) investigated how political variables affected international hotel chains' performance in Nairobi, Kenya, aiming to develop a framework for identifying political dimensions faced by these hotel chains. Primary data were collected through a questionnaire, and the analysis involved descriptive statistics. To evaluate the cumulative effect of independent variables (political circumstances and their effects) on the dependent variable (performance of international chain hotels), multiple linear regressions were performed. Conversely, the study's concentration was different from the current study's in that it was on the hotel business.

Onoriode and Agbele (2021) focused on a few SMEs in Delta State to investigate the impact of political influences on organizational performance. As a result of field study, four hypotheses were investigated and research questions using a descriptive survey research design were developed. 37 industries from throughout the state made

up the research population, and 356 respondents were chosen via judgmental sampling. Both primary and secondary data collection methods were used, and correlation coefficient analysis was employed. The findings indicated that SME efficiency is contingent upon and sensitive to political factors. Moreover, stable political factors were found to influence customer satisfaction and encourage employee retention. Notably, this study was conducted outside Kenya and was specifically limited to SMEs.

2.3.5 Government Policies, Macro Environment and Performance of Roads Construction Projects

Kinyua (2018) aimed to assess the impacts of government policy and the macro-environment on rural electrification in Kenya. The study targeted households, the business community, schools under rural electrification, and industries, utilizing a non-probability sampling approach. The sample size was 500 out of a total population of 4500 households. Questionnaires and feedback forms were employed for data collection, with qualitative data analyzed through qualitative analysis, and both inferential and descriptive statistics used for quantitative data. Multiple linear regression analysis was performed to determine factors influencing electrification projects, revealing the significance of electricity in Kenya's economy. However, the study's focus on rural electrification left a conceptual gap in the understanding of broader aspects.

Ochenge (2018) set out to look into how project management techniques affected the way road infrastructure projects in the Lake Basin Region performed, particularly those that were built by regional businesses. Targeting four road infrastructure projects in the Lake Basin Region, the study combined descriptive and explanatory research designs. There were ninety-five responders in total, comprising elected local leaders, contractors, project managers, and government monitoring and evaluation personnel. Primary data were gathered via a semi-structured questionnaire, and descriptive and inferential statistics were used for analysis. The impact of project management techniques on the performance of road projects was evaluated using multiple regression analysis. Findings highlighted the significance of project resource mobilization, monitoring and evaluation, group dynamics management, and

project risks management. Notably, the study did not focus on the performance of road construction projects, presenting a conceptual gap in understanding this specific area.

2.3.6 Stakeholders' Involvement, Macro Environment and Performance of Roads Construction Projects

Githinji, Ogolla, and Kitheka (2020) aimed to ascertain how Kenya Ferry Services' project performance was affected by stakeholder involvement. The study chose a sample of 70 respondents and used a descriptive research approach to target a group of 23 stakeholders from Kenya Ferry Services partners. After a pilot study, data was gathered via questionnaires, and SPSS was used for linear regression analysis. The results showed that project success was greatly and favorably impacted by stakeholder involvement in project identification, planning, monitoring, and funding. Key influencing factors included organization respect for stakeholders' concerns in project identification, involving stakeholders in decision-making for project planning, standardized monitoring practices using inspection lists, and involving stakeholders in resource allocation for project funding. However, the study did not focus on road construction projects, leaving a conceptual gap in understanding this specific context.

Njogu (2016) investigated how stakeholder participation affected an automobile emission control project's performance. The study employed a descriptive survey research approach to examine connections between variables using descriptive and inferential analysis techniques, including regression and correlation. The results indicated that the effectiveness of the Automobile Emission Control Project was significantly influenced by the participation of stakeholders in project identification, planning, implementation, and monitoring. The performance of the project was positively and significantly impacted by stakeholder interaction in each phase. Despite the valuable insights gained in the automobile industry, the study did not specifically address road construction projects, creating a conceptual gap in understanding this domain.

2.4 Summary of Literature Review and Research Gaps

The section commenced with the presentation of the conceptual framework, elucidating the theoretical foundations that underpin the study. The systems theory, upper echelons theory, stakeholders' theory, and contingency theory were expounded upon, detailing the variables associated with each theory. Additionally, the inherent limitations of each theoretical framework were outlined. Subsequently, the empirical literature pertaining to the study's objectives was introduced. The review encompassed studies that highlighted the direct impact of the macroenvironment and stakeholders on the performance of roads construction projects.

Table 2.1: Summary of Literature Review and Research Gap

Variable	Author(s)	Title	Research Design	Findings	Research Gaps	Focus of current study
Socio-Cultural Environment	Wambui and Kisimbii (2020)	Influence of social-cultural aspects on the performance of community-based projects in Kilifi County in Kenya	The research utilized Descriptive research approach	The research revealed that the belief system has a substantial effect on the performance of community-based programs in Kilifi County, Kenya. The research observed that the registered unemployment rate, religious distribution, age distribution and composition, ethnic/tribal profiling, infrastructure disparity, and gender distribution had considerable effects on the performance of Community-based projects in Kilifi County.	The study had a conceptual gap as it focused on community-based projects rather than road construction. Additionally, it lacks a theoretical explanation of how these factors translate to larger infrastructure projects.	The current research addresses this by focusing specifically on road construction projects in Nairobi City County and linking socio-cultural factors to broader infrastructure development theories.
	Owuze (208)	An Analysis of the Socio-Cultural Environment and	Correlational research design was used	The study established a notable inverse correlation between the societal adoption of lifestyle changes,	The research had a contextual and methodological gap as it was done in Nigeria	The current study addresses these gaps by focusing on road construction projects in Nairobi City County

		Performance Influences on Manufacturing Enterprises in Nigeria		societal attitudes, and the performance of industrial enterprises in terms of values and norms.	and used the correlational research design which was different from the current study. It also did not account for the dynamic interplay between socio-cultural factors and political stability.	and employing a descriptive and explanatory research design.
Economic Factors	Mobegi, Sang and James (209)	Effect of the Economic Factors on the performance of donor-funded health projects in Kenya	The study utilized explanatory and descriptive research designs	The study suggested that Economic Factors have a substantial impact on the success of donor-funded health projects.	The study had a conceptual gap as it was limited to health projects. Moreover, it did not explore the complex interactions between economic factors and technological advancements.	The current study fills this gap by examining the influence of economic factors on road construction projects in Nairobi City County.
	Maina and Gathenya	Influence of economic	Descriptive study design	The study showed that project management in	The study presented a	The current research seeks to determine the

	(204)	factors on performance of project management amongst petroleum marketing firms in Kenya	was employed	petroleum marketing organizations is often unsuccessful, possibly due to a range of economic reasons that hinder their success.	conceptual gap as it did not have the same indicators as the current study. Additionally, it did not consider the moderating role of government policies.	influence of economic factors on the performance of Roads construction projects in Nairobi City County, Kenya and how these are moderated by governmental interventions.
Technological factors	Musyoka, Gakuu and Kyalo (207)	Influence of Technological factors on performance of gated community housing projects in Nairobi County, Kenya	Descriptive study design was employed	The study discovered that technological elements had a significant and influential effect on the success of gated community housing developments.	The focus on community housing projects presents a conceptual gap. Furthermore, it did not consider the rapid pace of technological change and its impact on large-scale infrastructure projects.	The current research aimed to ascertain the influence of the Technological factors on the performance of Roads construction projects in Nairobi City County, Kenya considering both current and emerging technologies
	Zorić, Makitan, Brtka and Mrđen	Modern technologies influence on project success factors in IT	A Quantitative Mono Method was conducted.	The study discovered that contemporary technologies are utilized in project management within the IT industry	The search did not concentrate on the macro	The aim of this research was to determine the impact of technological parameters on the

	(202)	sector of Serbia		of Serbia. Additionally, it examined the experts' perception of the extent to which these technologies contribute positively to project success. The analysis focused on the influence of these technologies on success factors.	environment and was conducted in Serbia, presenting conceptual and contextual gaps. It also failed to account for sector-specific technological challenges.	efficiency of road construction projects in Nairobi City County, taking into account the unique technological requirements of the construction industry.
Political factors	Kigera (2006)	Influence of Political factors on the Performance of International Hotel Chains in Nairobi, Kenya	Descriptive research design of ex- post facto and survey	The findings indicated a favorable impact of political considerations on the profitability of international hotel chains in Nairobi, Kenya.	Nevertheless, this study has a conceptual deficiency since it was carried out just inside the hotel industry. Furthermore, it failed to investigate the correlation between political stability and stakeholder	The intent of the current research was to examine the influence of political aspects on the outcomes of road construction projects in Nairobi City County, Kenya.

					participation.	
	Onoriode and Agbele (202)	Effect of Political factors on organizational performance with a focus on selected SMEs in Delta State	Descriptive survey research design was used	The findings indicate that the efficiency of SMEs is influenced by and responsive to political factors. Furthermore, stable political factors have a positive impact on customer satisfaction and also promote employee retention.	This research had conceptual and contextual gaps as it focused on SMEs in Nigeria. Additionally, it lacked a methodological approach to differentiate between short-term and long-term political impacts.	The current research aimed to ascertain the impact of political factors on the execution of road construction projects in Nairobi City County, Kenya.
Government policies	Kinyua (208)	Effect Of Government Policy and Macro Environment on Success of Rural Electrification in Kiambu County, Kenya	This study used descriptive survey design.	The factors that main determine electrification process are; the national government agenda on electrification, Kenya Power and Lighting Company commitment to distribution of electricity.	The focus on rural electrification presents a conceptual gap. Furthermore, it did not consider the broader implications of government policies on other infrastructure projects.	The intent of the current research was to examine the influence of government policies on the connection between macro environmental elements and the effectiveness of road construction projects in Nairobi City County, Kenya.

	Ochenge (208)	Effects of project management practices on the performance of road infrastructure projects in the Lake Basin Region constructed by local firms	The study employed both the descriptive and explanatory research design	The study determined that government policy lacked a moderating influence on the connection between study variables.	The focus on local firms in the Lake Basin Region presents a conceptual gap. Additionally, it did not consider the differential impact of various policy types.	The aim of the current research was to investigate the influence of government policies on the connection between macro environmental elements and the effectiveness of road construction projects in Nairobi City County, Kenya.
Stakeholders' Involvement	Githinji, Ogolla and Kitheka (2020)	Influence of stakeholder's involvement on project performance. A case study of Kenya Ferry Services	The research design used is descriptive survey	The study results demonstrated that the involvement of stakeholders in project identification was strongly and positively correlated with project performance.	However, this study focused on ferry services, presenting a conceptual gap. It also did not explore the nuanced roles of different stakeholders in infrastructure projects	The intent of this research was to determine the role of project stakeholders' involvement in moderating the connection between macro environment parameters and the performance of road construction projects in Nairobi City County, Kenya.
	Njogu (206)	Influence of stakeholder involvement on performance of automobile	This study utilized descriptive survey research	The study realized that the involvement of stakeholders in project identification has a significant impact on	This research presented a conceptual gap as it focused on a different	The current research sought to find out the mediating effect of project stakeholders' involvement on the

		Control Project	design	the performance of the Automobile Emission control project.	industry. Additionally, it did not consider the potential conflicts between various stakeholders	link between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya

2.5 Conceptual Framework

The conceptual framework serves to delineate the dependent, independent, as well as moderating and mediating variables, offering guidance to the study. The variables are centered on examining the interplay between the macro environment, government policies, stakeholders' involvement, and the performance of roads construction projects financed by Nairobi City County, Kenya.

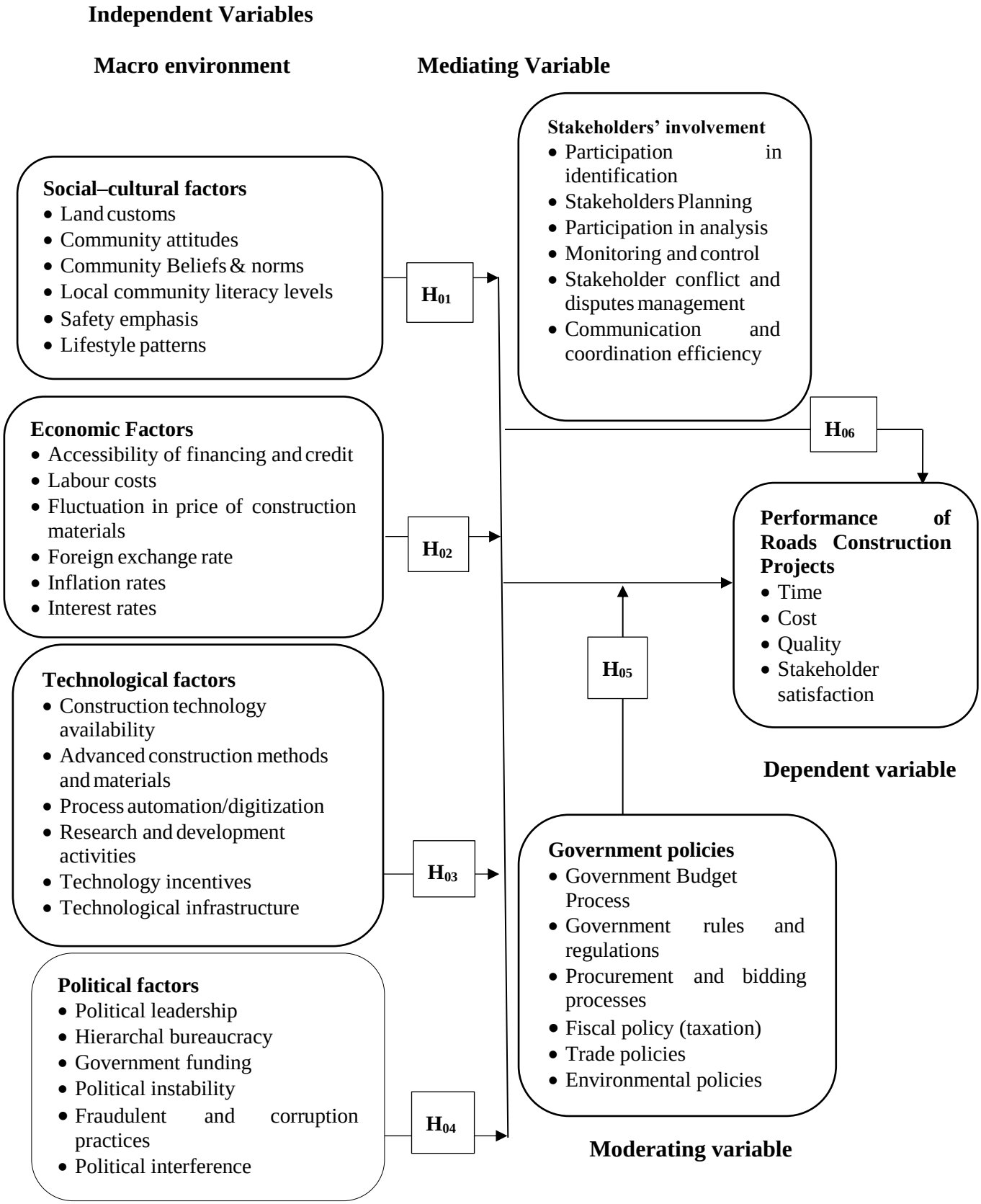

Figure 2.1: Conceptual Framework

Source: Author (2024)

The research concentrated on exploring the relationship between the macro environment and the performance of roads construction projects within Nairobi City County, Kenya. The macro environment variables under scrutiny included social-cultural, economic, technological, and political factors. The study delved into government policies and project stakeholders' involvement as moderating and mediating elements, respectively, in the link between macro environment factors and the success of roads construction projects in Nairobi City County.

For the evaluation of social-cultural attributes, the research considered land customs, community attitudes, community beliefs and norms, local community literacy levels, safety emphasis, and lifestyle patterns. Economic factors were gauged through an examination of accessibility to financing and credit, labor costs, fluctuations in the price of construction materials, foreign exchange rates, inflation rates, and interest rates. Technological factors were assessed based on the availability of construction technology, advanced construction methods and materials, process automation/digitization, research and development activities, technology incentives, and technological infrastructure. Political factors were measured by factors such as political leadership, hierarchical bureaucracy, government funding, political instability, and political interference.

As moderating variables, the study considered government rules and regulations, procurement and bidding processes, trade policies, and environmental policies. The mediating variables were assessed through identification, planning, analysis, monitoring and control, stakeholder conflict and disputes management, and communication and coordination efficiency. The dependent variable was evaluated in terms of time, cost, quality, and stakeholder satisfaction.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter offers an overview of the research methodology employed in the study, specifically explaining the procedures and strategies utilized for data collection and analysis. The content is divided into multiple categories, such as research philosophy, research design, empirical model, target audience, sampling strategies and sample size, data collection methods, data analysis techniques, study validity and reliability, and ethical issues.

3.2 Research Philosophy

This research utilized a positivist research philosophy, which is based on collecting quantitative data from respondents. Positivism, an epistemological philosophy, states that observation is based on objective standards rather than subjective ones. It highlights the importance of the observer being independent from the subject of study (Creswell & Clark, 2017). The primary advantage of a positivist approach resides in its methodical development and verification of hypotheses, empirical investigation, thorough examination, and the capacity to systematize findings into laws and predictions (Bell, Harley & Bryman, 2022).

In this study, primary data were collected through questionnaires, and the collected data underwent both descriptive statistics and inferential analysis. Adhering to the objectivity principle of positivism, the research conducted an impartial analysis of the data to draw inferences. Consequently, the creation and testing of hypotheses through statistical techniques aligned with the positivist philosophy.

3.3 Research Design

This study employed a research design that combined both descriptive and explanatory approaches. The utilization of these complementary designs enhances the research's robustness (Plomp, 2018). Combining explanatory and descriptive research methods allowed for the collection of data that could have been missed by

using a single design, in addition to offering more thorough insights into the topic of study.

3.4 Empirical Model

In this research, a multiple linear regression analysis was employed to ascertain the connection between the variables under investigation. The selection of this model was deemed appropriate due to the nature of the dependent variable, project performance, which is characterized as a continuous variable (Plomp, 2018).

Direct Effects Model

A multiple linear regression model was employed to ascertain the association between project performance and four independent research variables.

$$\mathbf{Y=\alpha+\beta_1X + \beta_2X_2+ \beta_3X_3 + \beta_4X_4 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1}$$

Where;

ε= error term,

β=coefficient of independent variable (β_{1-4}=regression coefficient) and α= constant ceteris paribus.

Y= performance of Roads construction projects in Nairobi City County

X_1= Composite index for social-cultural factors;

$X_{2=}$ Composite index for Economic Factors;

X_3= Composite index for Technological factors;

$X_{4=}$ Composite index for Political factors.

Mediating Effect of Project Stakeholders' Involvement

To examine the mediating impact of project stakeholders' engagement on the connection between the macroenvironment factors and the performance of roads construction projects in Nairobi City County, Kenya, the mediation effects model proposed by Fairchild and MacKinnon (2019) was applied as outlined below:

Step one: Regress Performance of Roads Construction Projects on Macro environment factors

Note the R square value (r^2_1) and the level of significance (at $p < 0.05$)

$$Y = \beta_0 + \beta_1 ME + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.2$$

Step Two: Regress Project Stakeholders' Involvement on Macro environment and note the significance of the relationship.

$$S_i = \beta_0 + \beta_1 ME + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.3$$

Step Three: Regress Performance of Roads Construction Projects on Macro environment factors and Project Stakeholders' Involvement and note the significance.

$Y= \beta_0+\beta_1 ME + \beta_2 S_i + \varepsilon$ **…….……3.4**

Where; ε= error term

β=coefficient of independent variable (β_{1-2}=regression coefficient)

ε = constant ceteris paribus.

Y= Composite index for Performance of Roads Construction Projects

ME = Composite index for Macro Environment

S_i = Composite index for Project Stakeholders' Involvement

Table 3. 1: Decision Criteria for Mediation

Model	Significance of the beta coefficient		Conclusion
Model 3.2	B_1; ($p > 0.05$)	-	There is no conclusion of mediated relationship.
Model 3.3	B_1; ($p \leq 0.05$)	-	There is a mediated relationship.
Model 3.4	B_1; ($p \leq 0.05$)	B_2; ($p \leq 0.05$)	There is partial mediation
Model 3.5	B_1; ($p > 0.05$)	B_2; ($p \leq 0.05$)	There is full mediation

Source: Fairchild and MacKinnon (2019)

Moderating Effect of Government policies

The analysis employed multiple linear regression techniques to analyze the impact of government policies on the link between macro environmental factors and the performance of road construction projects in Nairobi City County, Kenya, as described below:

Step 1: Regress Performance of Roads Construction Projects on Macro environment factors

Note the R square value (r^2_1) and the level of significance (at $p < 0.05$)

$$Y = \beta_0 + \beta_1 ME + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.5$$

Step Two: Introduce the Government policies and note the new R square value (R^2_2). Note also the level of significance (at $p < 0.05$) for the interactive term for the independent variable.

$$Y = \beta_0 + \beta_1 ME + \beta_2 G_p + \beta_3 MSG_p + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.6$$

Where; ε= error term

β=coefficient of independent variable (β_{1-3}=regression coefficient)

ε = constant ceteris paribus.

Y= Composite index for Performance of Roads Construction Projects

ME = Composite index for Macro environment

G_p = Composite index for Government policies

MSG_p = Interaction of Macro environment and Government policies

As per Flick (2020), the variation in R^2 (Extent of moderation) between Model 1 and Model 2 signifies the moderating impact of government policies on the relationship between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya. It is important to observe the significance level of the beta coefficient (at $p < 0.05$) for the interactive term. Should $p < 0.05$, the null hypothesis (H_0) is rejected; if $p > 0.05$, H0 is accepted.

3.5 Target Population

This research focused on a target population comprising 176 concluded roads construction projects within the Nairobi Metropolitan Area, executed by the Kenya

Rural Roads Authority (KeRRA) (refer to Appendix II). The entities observed included road engineers, project planners, and directors associated with KERRA, along with road supervisors, inspectors, surveyors, contractors, and members of project implementation teams as outlined in Table 3.2.

Table 3. 2: Target Population

Population	**Frequency**	**Percentage**
Road engineers	17	2.5
Project planners and Directors (KeRRA)	16	2.3
Road supervisors	81	11.7
Road inspectors	98	14.2
Road surveyors	194	28.0
Contractors	119	17.2
Project Implementation teams members (KeRRA)	167	24.1
Total	**692**	**100.0**

Source: County Records (2022)

3.6 Sample Size and Sampling Technique

3.6.1 Study Sample Size

The sample size was determined using Yamane (1967) model, and the study sought to use a sample size of 253 respondents.

According to Yamane (1967) Model:

$$n=N/1+N(e2) = \quad 692/1+692\ (0.05^2) = 253$$

Where: n = the desired sample size

e = margin of error; the probability of error (i.e., the desired precision, in this case, 0.05 for 95 percent confidence level)

N = the total population size.

3.6.2 Sampling Procedure

The primary sampling method employed in this study was stratified random sampling. This approach was chosen to ensure that each stratum, representing specific respondent categories, contributed to the overall sample in a representative manner (Snyder, 2019). Strata were formed based on distinct categories of respondents, each representing a group of units with unique characteristics. The utilization of stratified random sampling allowed for the systematic selection of respondents from each stratum through the application of simple random sampling techniques. The sample was distributed among the strata as shown in Table 3.3.

Table 3. 3: Sample Size Determination

Population	Frequency	Ratio	Sampling
Road engineers	17	0.366	6
Project planners and Directors (KeRRA)	16	0.366	6
Road supervisors	81	0.366	30
Road inspectors	98	0.366	36
Road surveyors	194	0.366	71
Contractors	119	0.366	44
Project Implementation teams members (KeRRA)	167	0.366	61
Total	**692**		**253**

3.7 Data Collection Instruments

The structured questionnaires employed for primary data collection featured questions with limited choices, allowing respondents to select from predefined options. This format was chosen to facilitate easier analysis, as outlined by Mohajan (2018), who emphasized the simplicity of analyzing closed-ended questions. The questionnaire design incorporated statements accompanied by predefined choices, aligning with the study variables.

Respondents were instructed to provide their responses in the form of a Likert scale ranging from 1 to 5 (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, and 5-Strongly Agree). This scale choice aimed to standardize responses and allow for

a nuanced understanding of the participants' perspectives. The decision to employ a questionnaire was based on considerations of cost-effectiveness, absence of bias, and the provision of sufficient time for respondents to comprehend and respond to the statements. Questionnaires were preferred for their resource and time efficiency, immediate usability, and suitability for survey studies. The questionnaire consisted of three sections: the first gathering information regarding the demographic characteristics of the respondents, the second focused on collecting data related to the study variables, and the third centered on the performance of roads construction projects.

3.7.1 Pilot Study

A pilot study was done by the researcher to evaluate the validity and reliability of the questionnaire, which is a critical step in the research process to determine the instrument's effectiveness (Gorard, 2018). The test-retest method was utilized to evaluate the research instruments' reliability, involving administering the identical test to the same individuals twice, separated by a certain amount of time. The pilot survey included 25 respondents who were selected randomly and were not part of the final sample. Flick (2020) emphasizes the importance of pilot testing in identifying and addressing unclear questions and instructions. Random sampling was employed to select the pilot team. Pre-testing of the questionnaire was extensive and included testing of the form, difficulty, directions, order, language, and content of the questions. The input received from the pilot study was essential in improving the questionnaire prior to its ultimate dissemination to the research participants.

Reliability, which measures the consistency of results, was assessed through a pilot test with key informants before the full administration of the questionnaire. The split-half method was used to evaluate the study's reliability by computing the alpha coefficient. The alpha value, ranging from 0 to 1, with higher values suggesting greater reliability, aimed to ensure that the study results could be replicated in a separate investigation. A reliability coefficient of 0.7 is widely accepted as indicating satisfactory reliability (Plomp, 2018). The split-half method examined the equal contribution of all parts of the test to the overall result through the comparison

of the outcomes of one half of the test with the results of the other. The outcomes of this evaluation are presented in Table 3.4.

Table 3. 4: Reliability Test Results

Variable	Number of questionnaire items	α-Value	Conclusion
Socio-cultural factors	6	0.714	Reliable
Economic factors	6	0.763	Reliable
Technological factors	6	0.741	Reliable
Political factors	6	0.721	Reliable
Government policies	6	0.701	Reliable
Stakeholder involvement	6	0.708	Reliable
Project performance	4	0.709	Reliable
Aggregate score		**0.722**	**Reliable**

Source: Pilot Study (2023)

The outcomes indicated that the alpha values for each variable, as depicted in Table 3.4, surpassed 0.7 in the reliability test. This signifies that the questionnaires demonstrated a commendable level of reliability, consistent with the standard set by Plomp (2018), which deems a reliability coefficient of 0.7 as acceptable. Consequently, it is reasonable to assert that the questionnaire exhibited a high level of reliability.

Validity, the degree to which evidence supports inferences from collected data, was ensured through a content validity assessment. The instrument underwent review and approval by the supervisor to ensure its relevance to the study. An expert assessed the instrument's ability to measure and determine the content of a specific concept. Content validity aimed to guarantee a consistent understanding by respondents of all items in the questionnaire, minimizing misconceptions and misunderstandings (Ørngreen & Levinsen, 2017). According to Plomp (2018), content validity expands the range of items that resemble test items and allows conclusions to be drawn from test scores. This method entails aligning the research

instrument's questions to appropriately evaluate the characteristics of the research variables and concepts as projected.

To ensure construct validity, the researcher created study instruments that were easy to understand and use, encouraging respondents to provide relevant answers. This was achieved through meticulous editing of the research instruments to ensure high-quality content representation. The investigator obtained confirmation of the questionnaire's content and design from fellow researchers and subject matter experts (Flick, 2020). Feedback from supervisors and other university teachers, as well as from individuals who had successfully completed their research projects, was also sought to enhance the questionnaire's validation. According to Gorard (2018), content validity refers to how well an instrument captures the behaviors and subject matter that the researcher is trying to assess.

3.7.2 Operationalization and Measurement of Variables

Operationalization involves identifying a measurable, quantifiable, and valid index for both independent and dependent variables (Creswell & Clark, 2017). Objective, independent, and concrete factors are readily measured using appropriate equipment, whereas subjective, dependent, or abstract factors pose challenges in measurement. The operationalization of all variables is outlined in Table 3.5.

Table 3. 5: Operationalization of Variables

Variable	Variable type	Operationalization	Hypothesized direction	Measurement level	Measurement Scale
Performance of roads construction projects	Dependent	Composite measure of time, cost, quality and stakeholder satisfaction for each project	None	Interval	5-point Likert scale
Social-cultural factors	Independent	Perception on the effect of land customs, community attitudes, community beliefs & norms, local	Positive	Interval	5-point Likert scale

		community literacy levels, safety emphasis and lifestyle patterns affected persons on project performance			
Economic Factors	Independent	Perception on the effect of accessibility of financing and credit, labour costs, fluctuation in price of construction materials, foreign exchange rate, inflation rates and interest rates on project performance	Positive	Interval	5-point Likert scale
Technological factors	Independent	Perception on the effect of construction technology availability, advanced construction methods and materials, process automation/digitization, research and development activities, technology incentives and technological infrastructure on project performance	Positive	Interval	5-point Likert scale
Political factors	Independent	Perception on the effect of political leadership, hierarchal bureaucracy, government funding, political instability,	Positive	Interval	5-point Likert scale

		fraudulent and corruption practices and political interference on project performance			
Government policies	Moderating	Perception on the effect of government budget process, government rules and regulations, procurement and bidding processes, fiscal policy (taxation), trade policies and environmental policies on project performance	Positive	Interval	5-point Likert scale
Project stakeholders' involvement	Mediating	Perception on the effect of participation in identification, stakeholders planning, participation in analysis, monitoring and control, stakeholder conflict and disputes management and communication and coordination efficiency on project performance	Positive	Interval	5-point Likert scale

3.8 Data Collection Procedure

A letter of introduction from the researcher's university was provided to the respondents to secure permission for posing questions. Additionally, the researcher obtained a permit from NACOSTI to collect necessary data. Participants were

allotted a week to complete the questionnaire, a strategic approach to enhance response rates given their busy work schedules. The researcher, aided by assistants, administered the questionnaires using a drop-and-pick-later strategy, occasionally employing Google Docs for optimal response rates. Two days prior, the researcher scheduled appointments with the firms to ensure smooth questionnaire delivery. Ethical considerations were paramount, and the researcher communicated the study's significance, ensuring respondents of confidentiality and identity protection.

3.9 Data Analysis and Presentation

The gathered field data was carefully sorted, cleaned, and filtered to meet the goals of the study. The information was then coded and entered into SPSS, Version 27.0, a statistical program, for analysis. Both descriptive and inferential statistics were used in this investigation. For every quantitative element of data, descriptive statistics were produced, including frequencies, percentages, mean scores, and standard deviation. The results were displayed in tables. Multiple linear regression, an inferential statistical technique, was utilized to evaluate the importance of every independent variable. This technique quantifies the relationship between independent and dependent variables based on observations, making it essential for assessing the impact of multiple variables simultaneously. It allows the analysis to control for confounding variables, providing a more accurate estimate of the effect of each independent variable. Moreover, multiple regression helps identify significant predictors, aiding in the prioritization of factors that need attention. It quantifies the strength and direction of the relationships between predictors and the outcome, facilitating a clear understanding of how each factor impacts project performance. Additionally, it can be used for predictive purposes, allowing for forecasting the performance of road construction projects based on varying levels of macroenvironmental factors.

3.9.1 Diagnostic Tests

Diagnostic tests were integral to this research to validate the suitability of data for the primary assumptions of multiple linear regression. A normality test was employed to assess whether the dataset adhered to a normal distribution, estimating the probability that a random variable underpinning the data is normally distributed.

Kolmogorov–Smirnov and Shapiro tests were utilized to assess the naturalness of the data, with a probability greater than 0.05 indicating normal distribution.

In the classical linear regression model, the Homoskedasticity assumption asserts that the probability distribution of the disturbance term remains consistent for all observations, implying the variance of each ui is uniform across all values of the explanatory variable. Conversely, if the disturbance terms exhibit non-constant variance or non-homogeneity of variance, known as heteroscedasticity, issues may arise (Flick, 2020). To detect such problems, the Breusch-Pagan or Cook-Weisberg test was employed in this study. Linearity was assessed through scatterplots, illustrating whether a linear relationship existed between two continuous variables. It was expected that the connection between variables would exhibit linearity before the application of regression models (Bell et al., 2022).

The multicollinearity test assesses the correlation between independent variables, ensuring that the collected data does not result from undesired trends in its distribution (Gorard, 2018). In this study, the analysis variables underwent a multicollinearity assessment using the Tolerance and Variance Inflation Factors (VIF) statistics. VIF indicates the strength of the linear relationship between independent variables. A VIF value exceeding 10 signifies multicollinearity, while Tolerance values below 0 suggest serious multicollinearity problems. Multicollinearity can diminish the accuracy of coefficient estimates, reducing statistical power in the regression model.

To evaluate the degree of sampling adequacy, Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) test were done. The KMO measure, ranging from 0 to 1, with values closer to 1 being preferable, serves as an indicator of sampling adequacy. A KMO value of 0.5 is considered an acceptable threshold (Williams, Brown, & Onsman, 2020). Bartlett's test of sphericity examines the null hypothesis that the correlation matrix is an identity matrix, assessing whether the samples are from populations with equal variances.

3.10 Ethical Considerations

The study participants were provided with a debriefing that elucidated the study's purpose and emphasized the voluntary nature of participation. Respondents were

explicitly informed about the sensitive nature of certain questions posed and assured that the information provided would be treated with utmost confidentiality, ensuring their anonymity throughout the research process. Prior to their involvement, participants were required to provide informed consent, thereby signifying their voluntary agreement to participate. To conduct the research ethically, a research permit was secured from the NACOSTI, following the issuance of an introductory letter from the Business Administration Department at Kenyatta University.

CHAPTER FOUR: RESEARCH FINDINGS

4.1 Introduction

This chapter unveils the results derived from the analysis of the collected field data. It encompasses various sections, including the response rate, reliability tests, respondents' biodata, descriptive statistics, diagnostic test results, and the outcomes of inferential statistics. The presentation of the findings employs tables and figures for clarity.

4.2 Response Rate

A total of 253 questionnaires were disseminated among the respondents, constituting 6 road engineers, 4 project planners, and 2 directors from KeRRA, 30 road supervisors, 36 road inspectors, 7 road surveyors, 44 contractors, and 6 members of project implementation teams from KeRRA. The aggregated response rate is detailed in Table 4.1.

Table 4. 1: Response Rate

Category	Frequency	Percentage
Number of questionnaires returned	207	81.8
Number of questionnaires not returned	46	18.2
Total	**253**	**100**

Source: Research Data (2023)

As depicted in Table 4.1, there were 207 returned questionnaires out of the 253 administered, resulting in a response rate of 81.8%. Conversely, 46 questionnaires were not returned, constituting a non-response rate of 18.2%. Consequently, it was affirmed that the response rate was satisfactory for the purpose of generalization and drawing conclusions. This aligns with the guidance of Ørngreen and Levinsen (2017), who recommend a response rate of 70% and above as very good for data analysis.

4.3 Demographic Characteristics

The analysis of respondents' demographic information encompassed their highest education level and the duration of their engagement in roads construction projects within Nairobi City County. The summarized findings are presented below.

4.3.1 Respondents' Highest Academic Level

The research aimed to ascertain the distribution of the respondents based on their highest academic qualification. The outcomes are depicted in Figure 4.1.

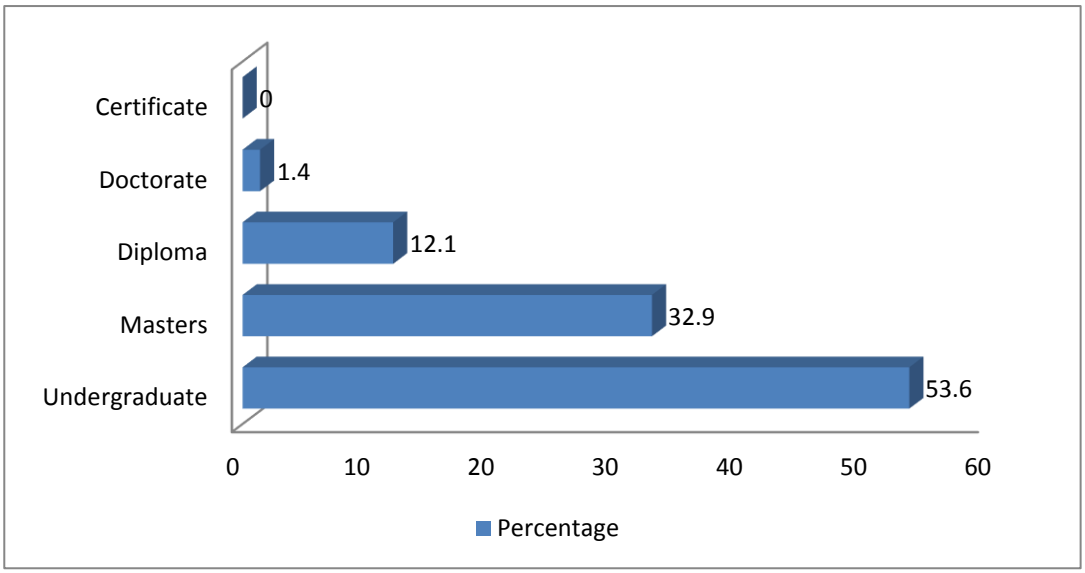

Figure 4. 1: Respondents' Highest Academic Level

Source: Research Data (2023)

The results depicted in Figure 4.1 illustrate that the majority of respondents, constituting 53.6%, had attained an undergraduate degree as their highest academic qualification. Following closely were respondents with a master's degree at 32.9%. Those with a diploma accounted for 12.1%, while 1.4% held a doctorate level of education. Notably, none of the respondents had a certificate as their highest educational qualification. This distribution implies that a significant proportion of the respondents possessed a considerable level of academic qualification. The emphasis on education was crucial in ensuring that the study gathered insights from respondents with a comprehensive understanding of roads construction project performance in Nairobi City County, Kenya. Education serves as a key factor in honing an individual's skill set, contributing to increased productivity in the

workplace. Research highlights the importance of education in improving problem-solving, analytical thinking, and decision-making skills—all of which are essential for efficient project management. Examples of these studies include the work of Hitt, Ireland, and Hoskisson (2017). Some study, as demonstrated by Sánchez et al. (2018), contends that practical experience is crucial, particularly in some industries, but other studies emphasize the special benefits of formal education, which offer insightful information about project difficulties.

4.3.2 Respondents' Number of Years Worked with Roads Construction Projects in Nairobi City County.

The findings, as illustrated in Figure 4.2, aimed to ascertain the representation of the number of years respondents had worked with roads construction projects in Nairobi City County.

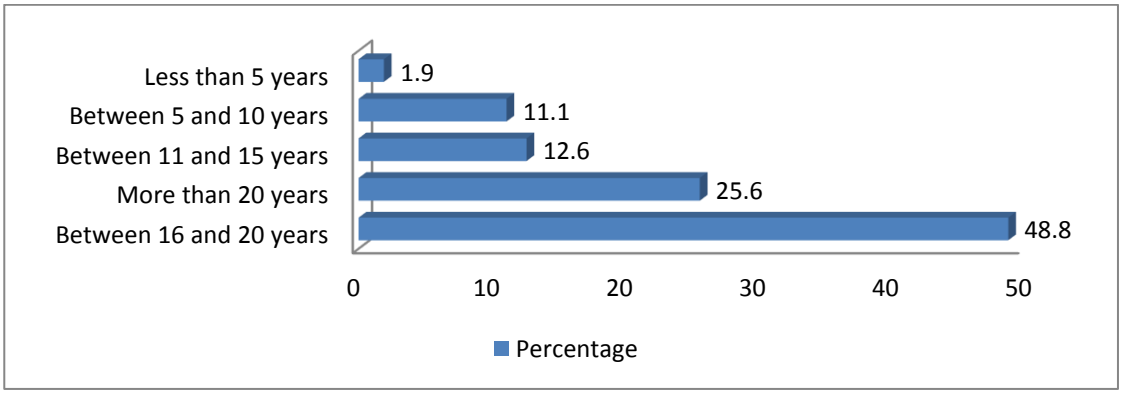

Figure 4. 2: Respondents' Number of Years Worked with Roads Construction Projects in Nairobi City County

Source: Researcher (2023)

The outcomes depicted in Figure 4.2 reveal that a significant proportion (48.8 percent) of the respondents had accumulated 16 to 20 years of experience working with roads construction projects in Nairobi City County, while 25.6 percent had over 20 years of experience. Additionally, 11.1 percent reported a tenure between 5 to 10 years, and 1.9 percent had less than 5 years of experience. This indicates that the study participants possessed substantial work experience in roads construction projects within Nairobi City County. This wealth of experience is crucial as it contributes to diverse perspectives and enhances decision-making quality in the management of

such projects. According to research by Kahneman and Klein (2019), experts with a great deal of experience frequently acquire intuitive decision-making abilities based on pattern recognition. Experienced professionals may exhibit better decision-making skills in the context of building projects, which will ultimately result in better project outcomes. It is important to remember, nevertheless, that some research such as Nonaka and Takeuchi's (2011) study argues that having too much experience in a certain field may lead to an inflexible attitude. They suggest that by including people with different backgrounds and fresh perspectives, we may challenge conventional wisdom and encourage creativity and innovative problem-solving.

The road projects included in the survey varied in scope, scale, and complexity. Most of the projects were initiated between 2020 and 2020, with completion dates ranging from 2018 to 2023. These projects included both new road constructions and major rehabilitations of existing roads. The surveyed projects were spread across different parts of Nairobi City County, including key arteries like the Ngong Road, the Outer Ring Road, and the Waiyaki Way. The projects involved multiple stakeholders, including government agencies, contractors, and local communities. Key project details such as start and end dates, total project cost, funding sources, and major challenges encountered during implementation were also collected. This comprehensive biodata helps to provide a clearer picture of the projects' environments and the contextual factors influencing their performance. Understanding these details is crucial for analyzing the impact of macroenvironmental factors on the performance of road construction projects in Nairobi City County.

4.4 Descriptive Analysis for Study Variables

The study analysed quantitative data using descriptive statistics which includes frequencies (f), percentages (%), Mean (M) and Standard Deviation (SD). The results are presented as per the study specific variables as follows;

4.4.1 Social-Cultural Factors

The study aimed to determine the correlation between social-cultural characteristics and the success of road construction projects in Nairobi City County, Kenya. The descriptive results of social-cultural factors are presented in Table 4.2.

Table 4. 2: Social-Cultural Factors

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Mean	Standard Deviation
	f(%)	f(%)	f(%)	f(%)	f(%)	M	SD
Local land customs have acted as an impediment against road construction projects	68(32.9)	119(57.5)	20(9.7)	0(0.0)	0(0.0)	4.23	.611
Community engagement helps in mitigating adverse attitudes towards road construction projects	80(38.6)	108(52.2)	18(8.7)	1(0.5)	0(0.0)	4.29	.641
Failure to adhere to community norms can result in conflicts and opposition.	87(42.0)	100(48.3)	20(9.7)	0(0.0)	0(0.0)	4.32	.644
The literacy levels of the local community have a direct impact on the outcomes of road construction projects in Nairobi City County.	78(37.7)	106(51.2)	20(9.7)	2(1.0)	1(0.5)	4.25	0.705
The local community's awareness of road construction safety measures is adequate	85(41.1)	104(50.2)	16(7.7)	1(0.5)	1(0.5)	4.31	.676
The efficiency of road construction projects in Nairobi	98(47.3)	97(46.9)	12(5.8)	0(0.0)	0(0.0)	4.42	.600

City County is influenced by indigenous culture patterns, like as work schedules and cultural behaviors.							

Source: Research Data (2023)

The outcomes outlined in Table 4.2 revealed that local land customs have posed challenges to road construction projects, as indicated by the relatively high mean score of 4.23. The narrow standard deviation of 0.611 suggests a tight clustering of responses around this mean, signifying a substantial consensus among participants concerning the obstructive role of local land customs. Specifically, 68 respondents (32.9%) strongly agreed with the statement, 119 respondents (57.5%) agreed, and 20 respondents (9.7%) expressed uncertainty. This result is consistent with a study conducted in West Sumatra, Indonesia by Buditiawan et al. (2022) that looked into how alternative road development plans based on local knowledge could mitigate societal consequences. The government's mitigation strategy in embracing local values within the community, followed by the formation and extension of satisfying community interests, is proven to be crucial to the success of road building.

Similarly, participants strongly endorsed the statement "Community engagement helps in mitigating adverse attitudes towards road construction projects," reflected in a mean score of 4.29. The moderate standard deviation of 0.641 indicates a degree of variability in responses, suggesting an overall agreement with some diversity in opinions among participants. Furthermore, 80 respondents (38.6%) strongly agreed with the statement, 18 respondents (8.7%) agreed, and 1 respondent (0.5%) expressed uncertainty. This conclusion is consistent with the findings of Adams and Sherar (2018), who point out that using community engagement strategies can result in improvements to the social and physical environment that are recognized, which can enhance project performance. Consequently, this could foster favorable perspectives among the community members who directly gain from the project.

For the statement "Non-compliance with community beliefs can lead to project conflicts and resistance," the substantial mean of 4.32 indicates a robust consensus

among respondents, emphasizing strong agreement. Despite a moderate standard deviation of 0.644, reflecting some diversity in opinions, there is an overall alignment regarding the potential consequences of non-compliance. Additionally, 87 respondents (42.0%) strongly agreed with the statement, 100 respondents (48.3%) agreed, and 20 respondents (9.7%) expressed uncertainty. This result is consistent with the theory put out by Ahmed, Mohamed, and Ahmed (2022), which holds that sociocultural factors influence a society's views, values, and lifestyle choices. They go on to explain that sociocultural factors, such literacy rates in the area and regional norms, have a big impact on how well a project turns out.

Concerning "The literacy levels of the local community contribute to the success of road construction projects," the mean of 4.25 suggests a general consensus, while the moderate standard deviation of 0.705 points to a degree of variability in responses, indicating diverse opinions on the impact of literacy levels. Furthermore, 78 respondents (37.7%) strongly agreed with the statement, 106 respondents (51.2%) agreed, 20 respondents (9.7%) expressed uncertainty, 2 respondents (1.0%) disagreed, and 1 respondent (0.5%) strongly disagreed. This conclusion is consistent with the work of Mobegi, James, and Sang (2020), who carried out an empirical study on the impact of social and cultural characteristics on the effectiveness of donor-funded health projects in Kenya, including community literacy, community support, language, and levels of corruption. The findings of the regression analysis showed that the performance of donor-funded health projects in Kenya was favorably correlated with language, community support, and literacy levels.

Respondents exhibited strong agreement with the statement "The local community's awareness of road construction safety measures is adequate," as indicated by the elevated mean of 4.31. While the standard deviation of 0.676 suggests a moderate level of variability in responses, showcasing some diversity in participants' perceptions, an overall consensus is observed. Moreover, 85 respondents (41.1%) strongly agreed with the statement, 104 respondents (50.2%) agreed, 16 respondents (7.7%) expressed uncertainty, and 1 respondent (0.5%) disagreed. This result is consistent with research conducted in 2023 by Babaei, Locatelli, and Sainati, which looked into local community engagement strategies in relation to transportation

megaprojects. The research emphasized the significance of involving nearby communities at the outset of planning in order to raise awareness and guarantee complete involvement.

Regarding the statement "Local lifestyle patterns, such as working hours and cultural practices, impact the efficiency of road construction projects," participants strongly agreed, evidenced by the high mean of 4.42. The low standard deviation of 0.600 indicates a tight clustering of responses around the mean, indicating a high level of consensus among participants regarding the substantial impact of local lifestyle patterns on project efficiency. Additionally, 98 respondents (47.3%) strongly agreed with the statement, 97 respondents (46.9%) agreed, and 12 respondents (5.8%) expressed uncertainty. This result is in contrast to a research by Owuze (2018) that looked at the performance and sociocultural context of Nigerian manufacturing companies. The study discovered a strong inverse link between societal changes in lifestyle and business performance.

4.4.2 Economic Factors

The study aimed to ascertain the correlation between economic variables and the efficiency of road construction projects in Nairobi City County, Kenya. The descriptive results of economic factors are presented in Table 4.3.

Table 4. 3: Economic Factors

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Mean	Standard Deviation
	f(%)	f(%)	f(%)	f(%)	f(%)	M	SD
Adequate access to financing and credit facilities can help mitigate delays in road construction projects in Nairobi City County	57(27.5)	75(36.2)	35(16.9)	27(13.0)	13(6.3)	3.66	1.192
Cost of labor for roads construction	62(30.0)	80(38.6)	59(28.5)	6(2.9)	0(0.0)	3.96	.838

projects sometimes exceeds the budgeted plan							
Fluctuations in the price of construction materials make it challenging to adhere to project budgets in Nairobi City County	63(30.4)	96(46.4)	39(18.8)	9(4.3)	0(0.0)	4.03	.818
The foreign exchange rate has a significant impact on the financial feasibility of road construction projects in Nairobi City County	64(30.9)	92(44.4)	47(22.7)	4(1.9)	0(0.0)	4.04	.784
Fluctuations in inflation rates make it challenging to accurately estimate project budgets and timelines	53(25.6)	125(60.4)	26(12.6)	3(1.4)	0(0.0)	4.10	.657
Effective interest rate management practices are employed to minimize project financing risks	70(33.8)	109(52.7)	27(13.0)	1(0.5)	0(0.0)	4.19	.691

Source: Research Data (2023)

The results depicted in Table 4.3 suggested that participants demonstrated a moderate level of agreement (mean of 3.66) concerning the potential of financing and credit facilities in mitigating delays. The relatively high standard deviation of 1.192 suggests a considerable diversity of opinions, indicating a wide range of views among participants. Furthermore, 57 respondents (27.5%) strongly agreed with the statement, 75 respondents (36.2%) agreed, 35 respondents (16.9%) were unsure, 27 respondents (13.0%) disagreed, and 13 respondents (6.3%) strongly disagreed.

Participants expressed moderate agreement (mean of 3.96) with the statement that the cost of labor can surpass budgeted plans. The standard deviation of 0.838 indicates some variability in responses, suggesting differing opinions among participants. Additionally, 62 respondents (30.0%) strongly agreed with the statement, 80 respondents (38.6%) agreed, 59 respondents (28.5%) were unsure, and 6 respondents (2.9%) disagreed. This result is consistent with Olawale and Sun's (2018) observation that prices can increase for high-value products or those that need to be delivered quickly. The research of economic determinants has demonstrated that, in the context of general economic growth, labor costs, organizational effectiveness, and the availability of credit and finance all draw goodwill from different segments of the state.

The mean of 4.03 indicates a relatively high level of agreement regarding the challenge posed by fluctuations in construction material prices. The standard deviation of 0.818 suggests some variability in responses, reflecting diverse perspectives among participants. Moreover, 63 respondents (30.4%) strongly agreed with the statement, 96 respondents (46.4%) agreed, 39 respondents (18.8%) were unsure, and 9 respondents (4.3%) disagreed. This result is consistent with the findings of Aguilla-Escobar and Garrido-Vega (2016), who claim that all industries—manufacturers, suppliers, service providers, wholesale and retail, government, and non-governmental organizations—are greatly impacted by the state of the economy. Companies' evaluations of economic aspects heavily rely on fundamental economic statistics such the consumer price index, net disposable income, interest rates, unemployment, and GDP.

Participants demonstrated a high level of agreement (mean of 4.04) concerning the significant impact of foreign exchange rates on the financial feasibility of road construction projects. The standard deviation of 0.784 suggests a moderate level of variability in responses, indicating diverse viewpoints. Moreover, 64 respondents (30.9%) strongly agreed with the statement, 92 respondents (44.4%) agreed, 47 respondents (22.7%) were unsure, and 4 respondents (1.9%) disagreed. This result is consistent with the findings of Maina and Gathenya (2022), who examined how

economic factors affected the way petroleum marketing companies in Kenya performed project management. They found that government funding, joint ventures, foreign investments, and foreign currency exchange rates all had an impact on project success.

Respondents strongly agreed (mean of 4.10) with the statement that fluctuations in the inflation rate pose challenges in estimating project budgets and timelines. The low standard deviation of 0.657 suggests a higher level of consensus among participants. The findings revealed that 53 respondents (60.4%) strongly agreed with the statement, 125 respondents (60.4%) agreed, 26 respondents (12.6%) were unsure, and 3 respondents (1.4%) disagreed. This result is in line with Ahmed's (2021) observation that the most important influences on an organization's development are economic factors like interest rates, inflation, and foreign currency rates.

Participants expressed a high level of agreement (mean of 4.19) regarding the use of effective interest rate management practices to minimize project financing risks. The standard deviation of 0.691 indicates a moderate level of variability in responses, suggesting a diversity of opinions among participants. Moreover, 70 respondents (33.8%) strongly agreed with the statement, 109 respondents (52.7%) agreed, 27 respondents (13.0%) were unsure, and 1 respondent (0.5%) disagreed. This research supports Moses' (2019) assertion that revenue growth has a significant impact on an organization's ability to develop and perform. The global market is influenced by a number of factors, including labor costs, currency fluctuations, national taxes, interest rate changes, and raw material pricing.

4.4.3 Technological Factors

The study sought to investigate the relationship between technological factors and performance of roads construction projects in Nairobi City County, Kenya. The descriptive results of technological factors are presented in Table 4.4.

Table 4. 4: Technological Factors

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Mean	Standard Deviation
	f(%)	f(%)	f(%)	f(%)	f(%)	M	SD
Advanced construction technology is readily available in the market that helps improve the performance of our road construction projects	46(22.2)	121(58.5)	39(18.8)	0(0.0)	0(0.0)	4.02	.657
There is a clear advantage in terms of project efficiency and quality when advanced construction methods and materials are employed in road construction projects	60(29.0)	103(49.8)	40(19.3)	3(1.4)	1(0.5)	4.05	.765
Digitization/automation of processes has enabled contractors to solve and foresee complex technicalities when even before construction begins	49(23.7)	125(60.4)	26(12.6)	7(3.4)	0(0.0)	4.04	.706
Investments in research and development are actively pursued to improve road construction processes in Nairobi City County	63(30.4)	86(41.5)	51(24.6)	6(2.9)	1(0.5)	3.99	0.845
The availability of technology incentives motivates contractors to incorporate advanced technology in their construction processes	130(62.8)	66(31.9)	11(5.3)	0(0.0)	0(0.0)	4.57	0.594
We effectively utilize available technological infrastructure to enhance the efficiency of our road construction projects	47(22.7)	67(32.4)	41(19.8)	46(22.2)	6(2.9)	3.50	1.153

Source: Research Data (2023)

The results presented in Table 4.4 indicate that the respondents generally agreed (mean of 4.02) that advanced construction technology is readily available and enhances the performance of road construction projects. The relatively low standard deviation of 0.657 suggests a moderate level of consensus among participants, indicating a shared perception. Further, 46 respondents (22.2%) strongly agreed with the statement, 121 respondents (58.5%) agreed, and 39 respondents (18.8%) were unsure. This result is consistent with Rugenyi's (2016) assertion that the use of contemporary information systems and building technologies can lead to institutional sustainability and expansion.

Participants expressed agreement (mean of 4.05) with the statement that employing advanced construction methods and materials provides a clear advantage in project efficiency and quality. The standard deviation of 0.765 suggests a moderate level of variability in responses, indicating some diversity of opinion among participants. Moreover, 60 respondents (29.0%) strongly agreed with the statement, 103 respondents (49.8%) agreed, 40 respondents (19.3%) were unsure, 3 respondents (1.4%) disagreed, and 1 respondent (0.5%) strongly disagreed. This conclusion is consistent with the explanation provided by Gruden and Stare (2018), who explain that process digitization leads to new methods of project delivery and enhances the manner that different project stages are carried out.

Respondents generally agreed (mean of 4.04) that digitization and automation enable contractors to address complex technicalities before construction begins. The moderate standard deviation of 0.706 indicates a degree of variability in responses, suggesting some diversity in viewpoints among participants. Further, 49 respondents (23.7%) strongly agreed with the statement, 125 respondents (60.4%) agreed, 26 respondents (12.6%) were unsure, and 7 respondents (3.4%) disagreed. This result is consistent with the study conducted by Sirisomboonsuk, Gu, Cao, and Burns (2018), which found that IT sophistication moderates the association between service practice and performance. The study examined the relationship between project performance, service practices and performance, and IT sophistication.

The mean of 3.99 indicates a generally positive perception regarding the pursuit of research and development to enhance road construction processes. The standard deviation of 0.845 suggests a moderate level of variability, indicating some diversity in respondents' opinions on this matter. Also, 63 respondents (30.4%) strongly agreed with the statement, 86 respondents (41.5%) agreed, 51 respondents (24.6%) were unsure, 6 respondents (2.9%) disagreed, and 1 respondent (0.5%) strongly disagreed. This result is consistent with that of Memon et al. (2023), who discovered that, for the typical company, IT investments are regarded as a major and value-adding activity. In his conclusion, Bergeron makes the argument that information technology must be tailored to the goals, structure, and environment of a company.

Participants strongly agreed (mean of 4.57) that technology incentives motivate contractors to incorporate advanced technology. The low standard deviation of 0.594 suggests a high level of consensus among respondents, indicating a shared belief in the motivating influence of technology incentives. In addition, 130 respondents (62.8%) strongly agreed with the statement, 66 respondents (31.9%) agreed, and 11 respondents (5.3%) were unsure. This result is consistent with Assaad, El-Adaway, and Abotaleb's (2020) observation that, in order to improve an organization's information system and revenue collection marking system, it is imperative to impart management and marketing expertise to rural residents.

The mean of 3.50 indicates a moderate level of agreement regarding the effective utilization of technological infrastructure to enhance project efficiency. The high standard deviation of 1.153 suggests a notable diversity of opinions among participants, indicating a range of perspectives on the effectiveness of technological infrastructure utilization. Further, 47 respondents (22.7%) strongly agreed with the statement, 67 respondents (32.4%) agreed, 41 respondents (19.8%) were unsure, 46 respondents (22.2%) disagreed, and 6 respondents (2.9%) strongly disagreed. This result is consistent with the observations made by Musyoka, Gakuu, and Kyalo (2017) regarding the technological forces influencing the construction industry. These forces include the increased use of computer programs, sophisticated building materials and methods, technological innovations and trends in construction

automation, faster unit production rates, smart systems, advancements in artificial intelligence, and diversification.

4.4.4 Political Factors

The study sought to examine the relationship between the political factors and the performance of roads construction projects in Nairobi City County, Kenya. The descriptive results of political factors are presented in Table 4.5.

Table 4. 5: Political Factors

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Mean	Standard Deviation
	f(%)	f(%)	f(%)	f(%)	f(%)	M	SD
Local political leaders engage their counterparts in the national government to provide guarantees for the construction of roads construction projects in Nairobi City County	53(25.6)	70(33.8)	50(24.2)	25(12.1)	9(4.3)	3.64	1.118
The hierarchical bureaucracy within government agencies often leads to delays and inefficiencies in road construction projects	64(30.9)	79(38.2)	26(12.6)	23(11.1)	15(7.2)	3.74	1.214
The government funding is adequate for the completion of the road construction in time	62(30.0)	118(57.0)	22(10.6)	5(2.4)	0(0.0)	4.14	.696
Political instability in Nairobi City County is a	54(26.1)	111(53.6)	33(15.9)	6(2.9)	3(1.4)	4.00	.818

significant barrier to the successful execution of road construction projects							
Fraudulent and corrupt practices by government officials significantly hinder the timely execution of road construction projects in Nairobi City County	76(36.7)	76(36.7)	39(18.8)	14(6.8)	2(1.0)	4.01	.958
Political interference acts as stumbling blocks against construction of roads construction projects in Nairobi City County	100(48.3)	93(44.9)	14(6.8)	0(0.0)	0(0.0)	4.42	.616

Source: Research Data (2023)

The results presented in Table 4.5 indicate that the respondents demonstrated a moderate level of agreement (mean of 3.64) regarding the engagement of local political leaders with their national counterparts for project guarantees. The standard deviation of 1.118 suggests a notable diversity of opinions among participants, indicating varying perceptions of this engagement. Further, 53 respondents (25.6%) strongly agreed with the statement, 70 respondents (33.8%) agreed, 50 respondents (24.2%) were unsure, 25 respondents (12.1%) disagreed, and 9 respondents (4.3%) strongly disagreed. This result is consistent with the observations made by Lu et al. (2020), who note that political and legal elements are related to shifts in governmental political leadership and modifications to laws, rules, and policies, respectively.

Participants generally agreed (mean of 3.74) that hierarchical bureaucracy contributes to delays and inefficiencies in road construction projects. The relatively high standard deviation of 1.214 suggests a significant diversity of opinions among

respondents, reflecting varying degrees of agreement. Also, 53 respondents (25.6%) strongly agreed with the statement, 64 respondents (30.9%) agreed, 79 respondents (38.2%) were unsure, 26 respondents (12.6%) disagreed, 23 respondents (11.1%) strongly disagreed. The results are congruent with those of Stojcetovic et al. (2022), who note that political stability, security, a clear and functional legal system, and public goods supplied by the state—infrastructure, environment, and information—are ideal circumstances for the growth of construction institutions.

The mean of 4.14 indicates a generally positive perception that government funding is adequate for timely project completion. The low standard deviation of 0.696 suggests a higher level of consensus among participants, indicating shared confidence in the adequacy of funding. Moreover, 62 respondents (30.0%) strongly agreed with the statement, 64 respondents (30.9%) agreed, 118 respondents (57.0%) were unsure, 22 respondents (10.6%) disagreed, and 5 respondents (10.6%) strongly disagreed. The results are consistent with those of Akanni et al. (2022), who suggest that government initiatives are a component of the construction process along with those of suppliers and customers. Depending on its nature and the specifics of the local situation, some laws may also fall under the purview of political or legal forces.

Respondents generally agreed (mean of 4.00) that political instability is a significant barrier to successful project execution. The standard deviation of 0.818 indicates a moderate level of variability, suggesting some diversity in opinions among participants. Also, 54 respondents (26.1%) strongly agreed with the statement, 111 respondents (53.6%) agreed, 33 respondents (15.9%) were unsure, 6 respondents (2.9%) disagreed, and 3 respondents (1.4%) strongly disagreed. The results are congruent with those of Stojcetovic et al. (2022), who suggest that political stability, security, a clear and functional legal system, and public goods supplied by the state infrastructure, environment, and information are ideal circumstances for the growth of construction institutions.

Participants generally agreed (mean of 4.01) that fraudulent and corrupt practices by government officials hinder project execution. The standard deviation of 0.958 suggests a notable diversity of opinions, indicating varying perceptions of the extent

of this hindrance. In addition, 76 respondents (36.7%) strongly agreed with the statement, 76 respondents (36.7%) agreed, 39 respondents (18.8%) were unsure, 14 respondents (6.8%) disagreed, and 2 respondents (1.0%) strongly disagreed. The outcome is consistent with Barkauskas, Barkauskienė, and Jasinskas (2020), who point out that while legal papers typically support revenue collecting activities and, consequently, their performance, there are instances in which the action may be legally restricted owing to certain circumstances.

The high mean of 4.42 indicates strong agreement that political interference acts as a significant stumbling block to road construction projects. The low standard deviation of 0.616 suggests a high level of consensus among participants, indicating a shared perception of political interference as a substantial obstacle. Further, 100 respondents (48.3%) strongly agreed with the statement, 93 respondents (44.9%) agreed, and 14 respondents (6.8%) were unsure. The results corroborated those of Kigera (2016), who suggests that one of the primary barriers to construction enterprises' performance is the existence of hierarchical bureaucratic and regulatory constraints.

4.4.5 Government Policies

The research aimed to assess the moderating effect of government policies on the connection between the macroenvironment factors and the performance of roads construction projects in Nairobi City County, Kenya. The descriptive results of government are presented in Table 4.6.

Table 4. 6: Government Policies

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Mean	Standard Deviation
	f(%)	f(%)	f(%)	f(%)	f(%)	M	SD
Government budget allocations for infrastructure projects are clearly communicated and	121(58.5)	78(37.7)	8(3.9)	0(0.0)	0(0.0)	4.55	.572

transparent.							
Government rules and regulations are clear and easily understandable in the context of road construction projects in Nairobi City County	69(33.3)	105(50.7)	31(15.0)	2(1.0)	0(0.0)	4.16	.705
The procurement and bidding processes in Nairobi City County are transparent and free from corruption	96(46.4)	101(48.8)	10(4.8)	0(0.0)	0(0.0)	4.42	.584
Tax policies in Nairobi City County are conducive to private sector investment in road construction projects	80(38.6)	84(40.6)	35(16.9)	8(3.9)	0(0.0)	4.14	.833
The trade policy frameworks have been largely uncoordinated resulting in differing policy systems with differing requirements and compliance systems	72(34.8)	103(49.8)	28(13.5)	4(1.9)	0(0.0)	4.17	.730
Environmental Policy interventions are there in road infrastructure development to ensure that there is quality, reliability and attractiveness of road transport services	62(30.0)	83(40.1)	58(28.0)	4(1.9)	0(0.0)	3.98	.812

Source: Research Data (2023)

The results presented in Table 4.6 indicate that the respondents strongly agreed (mean of 4.55) that government budget allocations for infrastructure projects are transparent

and clearly communicated. The low standard deviation of 0.572 indicates a high level of consensus among respondents, suggesting a shared perception of transparency in budget communications. Further, 121 respondents (58.5%) strongly agreed with the statement, 78 respondents (37.7%) agreed, and 8 respondents (3.9%) were unsure. The results corroborate those of Assaad, El-Adaway, and Abotaleb (2020), who note that the project model should be in line with the laws and regulations governing construction.

Respondents generally agreed (mean of 4.16) that government rules and regulations in the context of road construction projects are clear and understandable. The standard deviation of 0.705 suggests a moderate level of variability in responses, indicating some diversity of opinion among participants. Also, 69 respondents (33.3%) strongly agreed with the statement, 105 respondents (50.7%) agreed, 31 respondents (15.0%) were unsure, and 2 respondents (1.0%) disagreed. The results align with Assaad et al. (2020), who suggest that government policy tries to be impartial, timely, and explicit in achieving goals. Just as crucial as the outcomes are well-structured guidelines for project implementation concerning fiscal taxation rules, environmental regulations, and bidding and procurement procedures.

Participants strongly agreed (mean of 4.42) that procurement and bidding processes in Nairobi City County are transparent and free from corruption. The low standard deviation of 0.584 indicates a high level of consensus among respondents, suggesting a shared belief in the transparency of these processes. Moreover, 96 respondents (46.4%) strongly agreed with the statement, 101 respondents (48.8%) agreed, and 10 respondents (4.8%) were unsure. The results are consistent with those of Galyna, Maria, and Nataliya (2019), who note that political factors determine the legal and regulatory framework in which the company functions.

The mean of 4.14 suggests a generally positive perception regarding tax policies being conducive to private sector investment. The high standard deviation of 0.833 indicates a notable diversity of opinions among participants, reflecting varying degrees of agreement on the conduciveness of tax policies. Further, 80 respondents (38.6%) strongly agreed with the statement, 84 respondents (40.6%) agreed, 35

respondents (16.9%) were unsure, and 8 respondents (3.9%) disagreed. The results are consistent with those of Jones (2020), who suggests that the form of implementation plays a critical role in influencing the degree to which prospective and new participants in the construction industry are willing to enter the market, take a risk with their money, and meet consumer demand.

Respondents generally agreed (mean of 4.17) that trade policy frameworks have been largely uncoordinated, resulting in differing systems. The standard deviation of 0.730 suggests a moderate level of variability in responses, indicating some diversity in opinions among participants. Moreover, 72 respondents (34.8%) strongly agreed with the statement, 103 respondents (49.8%) agreed, 28 respondents (13.5%) were unsure, and 4 respondents (1.9%) disagreed. The results support the idea that government policy should be timely, objective, and explicit in achieving its goals. Just as crucial as the outcomes are well-structured guidelines for project implementation concerning fiscal taxation rules, environmental regulations, and bidding and procurement procedures.

The mean of 3.98 suggests a moderate level of agreement regarding the presence of environmental policy interventions in road infrastructure development. The standard deviation of 0.812 indicates a notable diversity of opinions among participants, reflecting varying perceptions of the effectiveness of environmental policy interventions. Also, 62 respondents (30.0%) strongly agreed with the statement, 83 respondents (40.1%) agreed, 58 respondents (28.0%) were unsure, and 4 respondents (1.9%) disagreed. The results are consistent with Assaad, El-Adaway, and Abotaleb's (2020) observation that the construction norms and rules of the government should be reflected in the model of a project that is being implemented.

4.4.6 Stakeholders' Involvement

The study sought to ascertain the mediating effect of project stakeholders' involvement on the link between the macroenvironment factors and the performance of roads construction projects in Nairobi City County, Kenya. The descriptive results of stakeholders' involvement are presented in Table 4.7.

Table 4. 7: Stakeholders' Involvement

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Mean	Standard Deviation
	f(%)	f(%)	f(%)	f(%)	f(%)	M	SD
Stakeholders actively participate in the identification of road construction needs in Nairobi City County	76(36.7)	103(49.8)	20(9.7)	6(2.9)	2(1.0)	4.18	.798
Stakeholders play a significant role in planning road construction projects in Nairobi City County	82(39.6)	100(48.3)	23(11.1)	2(1.0)	0(0.0)	4.27	.691
The involvement of stakeholders in the analysis of project requirements leads to better decision-making for road construction projects in Nairobi City County	96(46.4)	87(42.0)	21(10.1)	3(1.4)	0(0.0)	4.33	.717
The project management team effectively monitors and controls stakeholder activities throughout the road construction project.	53(25.6)	135(65.2)	18(8.7)	1(0.5)	0(0.0)	4.15	.604
Disputes and conflicts among project stakeholders are efficiently	79(38.2)	79(38.2)	48(23.2)	1(0.5)	0(0.0)	4.14	.785

resolved to minimize disruptions to the road construction project.							
Information flows smoothly between stakeholders and there is efficient coordination among all parties involved in the road construction projects.	73(35.3)	102(49.3)	31(15.0)	1(0.5)	0(0.0)	4.19	.698

Source: Research Data (2023)

The results outlined in Table 4.7 suggest that respondents generally agreed (mean of 4.18) that stakeholders actively participate in identifying road construction needs. The standard deviation of 0.798 indicates a notable diversity of opinions among respondents, suggesting varying degrees of agreement regarding the extent of stakeholder participation in identification processes. Further, 76 respondents (36.7%) strongly agreed with the statement, 103 respondents (49.8%) agreed, 20 respondents (9.7%) were unsure, and 6 respondents (2.9%) disagreed. The results are consistent with the definition of stakeholders provided by Sansantoso and Gallage (2019), who stressed the importance of including all parties involved in project analysis. In the context of a road construction project, stakeholders are defined as individuals who are impacted by the decisions made by another party, such as the host community and government agencies.

Respondents expressed agreement (mean of 4.27) that stakeholders play a significant role in planning road construction projects. The standard deviation of 0.691 suggests a moderate level of variability in responses, indicating some diversity in opinions among participants regarding the extent of stakeholder involvement in planning. Further, 82 respondents (39.6%) strongly agreed with the statement, 100 respondents (48.3%) agreed, 23 respondents (11.1%) were unsure, and 2 respondents (1.0%) disagreed. The results support the claims made by Makoveyenko, Siden, and

Pyliavskyi (2020) that different stakeholders have varying roles and effects on a project, highlighting the necessity for contractors to select the right stakeholders.

Participants strongly agreed (mean of 4.33) that stakeholder involvement in project requirements analysis leads to better decision-making. The standard deviation of 0.717 suggests a moderate level of variability, indicating some diversity in opinions among participants regarding the impact of stakeholder involvement on decision-making. Also, 96 respondents (46.4%) strongly agreed with the statement, 87 respondents (42.0%) agreed, 21 respondents (10.1%) were unsure, and 3 respondents (1.4%) disagreed. The findings are consistent with Bezuhla & Bezuhla (2020), who suggest that project managers should make an effort to take into account the interests of all stakeholders and stress the significance of negotiating to at least satisfy the minimum needs.

The mean of 4.15 suggests agreement that the project management team effectively monitors and controls stakeholder activities. The low standard deviation of 0.604 indicates a higher level of consensus among participants, suggesting a shared perception of effective monitoring and control. The findings also revealed that 53 respondents (25.6%) strongly agreed with the statement, 135 respondents (65.2%) agreed, 18 respondents (8.7%) were unsure, and 1 respondent (0.5%) disagreed. The results are consistent with those of Opawole, Jagboro, Kajimo-Shakantu, and Olojede (2019), who note that in order for the project to move forward smoothly and yield high-quality outcomes, all of the external stakeholders—including the government, suppliers, customers, and contractors—need to communicate and coordinate effectively.

Participants generally agreed (mean of 4.14) that disputes and conflicts among stakeholders are efficiently resolved to minimize disruptions. The standard deviation of 0.785 suggests a notable diversity of opinions among respondents, indicating varying perceptions of the efficiency of conflict resolution. From the findings, 79 respondents (38.2%) strongly agreed with the statement, 79 respondents (38.2%) agreed, 48 respondents (23.2%) were unsure, and 1 respondent (0.5%) disagreed. The outcomes are consistent with the findings of Githinji, Ogolla, and Kitheka

(2020), who investigated how stakeholder involvement affected Kenya Ferry Services projects and came to the conclusion that stakeholder involvement in project identification had a substantial and favorable relationship with project performance.

The mean of 4.19 indicates agreement that information flows smoothly between stakeholders and there is efficient coordination. The standard deviation of 0.698 suggests a moderate level of variability in responses, indicating some diversity in opinions among participants regarding the efficiency of information flow and coordination. Also, 73 respondents (35.3%) strongly agreed with the statement, 102 respondents (49.3%) agreed, 31 respondents (15.0%) were unsure, and 1 respondent (0.5%) disagreed. The results are in accordance with Njogu's (2016) research into the impact of stakeholder involvement on automobile control project outcomes, which determined that stakeholder involvement in project identification had a substantial impact on the effectiveness of vehicle emission control projects.

4.5 Diagnostic Tests for Empirical Model

The study performed diagnostic tests which included; Normality test, heteroscedasticity test, linearity test, and multicollinearity test.

4.5.1 Normality Test

The normality of the data was confirmed by utilizing the Shapiro-Wilk one sample test. The results are presented in Table 4.8.

Table 4. 8: Normality Test

	Shapiro		
Variable	**Statistic**	**Df**	**Sig.**
Social cultural factors	0.784	207	0.217
Economic factors	0.796	207	0.296
Technological factors	0.880	207	0.345
Political factors	0.709	207	0.350
Project performance	0.811	207	0.229

Source: Research Data (2023)

Table 4.8 illustrates the statistical values for social-cultural factors, economic factors, technological factors, political factors, and project performance, which were 0.784, 0.796, 0.880, 0.709, and 0.81, respectively. Additionally, the significance values for each variable were greater than 0.05. Consequently, the study concluded that the data exhibited a normal distribution. This suggests that the data points are reasonably evenly dispersed around the mean, providing potential advantages for statistical analyses. The assumption of normal distribution is often embraced by researchers as it simplifies specific statistical procedures and facilitates the application of parametric tests. This normal distribution implies that the data is likely to be more dependable for making generalizations and drawing inferences about the population from which it was derived.

4.5.2 Heteroscedasticity Test

To ensure that the error term among different values of the macro environment has consistent variances, it was necessary to conduct a Heteroscedasticity test. Heteroscedasticity relates to the level of inequality in the variances of the data values for both the dependent and independent variables (Baum et al., 2023). The Breusch-Pagan (1980) test was applied to conduct the test. The findings are displayed in Table 4.9.

Table 4. 9: Heteroscedasticity

Test	Statistics	Df	prob.
Breusch-Pagan LM	118.231	207	0.001
Pesaran scaled LM	295.315	207	0.000
Bias-corrected scaled LM	308.117	207	0.000
Pesaran CD	58.025	207	0.000

Source: Research Data (2023)

The outcomes presented in Table 4.9 display the test statistic value, the test of degree-of-freedom, and the corresponding p-value. In this instance, the test statistic value, recorded at 118.23, significantly resides in the upper tail. Consequently, the null hypothesis positing constant variance, tested at the conventional significance level of 5%, was rejected. This rejection indicates a substantial variation in the variance of the residual term or error term.

4.5.3 Linearity Test

The study performed a linear regression using correlation coefficients. According to Field (2021), the p-values of independent variables were compared using the following criteria. A positive correlation indicates that there is an undeviating effect when the other variable increases. In this case, the p-value would be < 0.00 and the linearity test would show that independent and dependent variables have a linear relationship. The results are presented in Table 4.10.

Table 4. 10: Linearity Test

Variable		Project performance
Socio-cultural factors	Pearson Corr.	0.771
	Sig. (2-tailed)	0.001
Economic factors	Pearson Corr.	0.867
	Sig. (2-tailed)	0.000
Technological factors	Pearson Corr.	0.794
	Sig. (2-tailed)	0.000
Political factors	Pearson Corr.	0.765
	Sig. (2-tailed)	0.000

Source: Research Data (2023)

The outcomes presented in Table 4.10 reveal that the Pearson r values for socio-cultural factors were ($r=0.771$, $p<0.05$), economic factors ($r=0.867$, $p<0.005$), technological factors ($r=0.794$, $p<0.05$), and political factors ($r=0.765$, $p<0.05$). These findings indicate a positive and highly correlated relationship between the studied variables. Consequently, it can be inferred that there exists a linear relationship between these variables.

4.5.4 Multicollinearity Test

The study assessed multicollinearity by computing the variance inflation factor (VIF) and then examined the correlation coefficient between variables. The findings are displayed in Table 4.11.

Table 4. 11: Multicollinearity Test

	Collinearity Test		
Variable	**Statistic**	**Df**	**VIF**
Socio-cultural factors	0.819	207	2.854
Economic factors	0.664	207	3.641
Technological factors	0.730	207	1.810
Political factors	0.846	207	2.009

Source: Research Data (2023)

The outcomes presented in Table 4.11 reveal that the VIF values for socio-cultural factors were (VIF=2.854<10), economic factors (VIF=3.641<10), technological factors (VIF=1.810<10), and political factors (VIF=2.009<10). According to Cooper and Schindler (2011), a VIF exceeding 10 is typically interpreted as indicative of multicollinearity issues that can impact the study's findings. Therefore, it can be deduced that none of the variables under study exhibited multicollinearity, as each individual variable had a VIF value below 10. Hair et al. (2021) elaborate on VIF in the context of multicollinearity, highlighting that a VIF below 10 generally signifies the absence of severe multicollinearity. Researchers commonly employ this threshold to assess the independence of predictor variables in regression analysis.

4.6 Inferential Analysis

4.6.1 Multiple Regression Analysis

To find out how one variable affected another, multiple regression analysis was used. Regressing sociocultural, economic, technological, and political influences on project performance allowed for this realization. Tables 4.12, 4.13, and 4.14 present the combined regression analysis results, respectively.

Table 4. 12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769[a]	.806	.799	1.105

Source: Research Data (2023)

The outcomes presented in Table 4.12 reveal that the adjusted R-squared value stood at 0.799 (79.9%), indicating the proportion of the performance of road construction projects in Nairobi City County, Kenya, determined by socio-cultural, economic, technological, and political factors. Consequently, the remaining percentage (20.1%) is attributed to variables not specifically investigated in this study. Scholars such as Hair et al. (2019) emphasize that the adjusted R-squared serves as a valuable metric for assessing how effectively independent variables account for variability in the dependent variable. A higher adjusted R-squared value suggests a more robust fit of the model.

Table 4. 13: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.017	4	28.004	80.443	.001
	Residual	70.321	202	.348		
	Total	182.338	206			

Source: Research Data (2023)

Table 4.13 presents the results, which indicate that the significant value is less than 0.05, precisely at 0.001. Moreover, the statistical f value—which is 80.443—is higher than the statistical mean—which is 28.004. As thus, this confirms the model's significance.

Table 4. 14: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.704	.118		5.966	.000
	Socio-cultural factors	.812	.236	.713	3.441	.001
	Economic factors	.638	.207	.585	3.082	.002
	Technological factors	.769	.232	.734	3.315	.001
	Political factors	.824	.119	.641	6.924	.000

Source: Research Data (2023)

The findings in Table 4.14 revealed that a constant value at 0.704 represents the amount by which performance of roads construction projects in Nairobi City County,

Kenya would be when socio-cultural factors, economic factors, technological factors and political factors are kept constant.

The established regression equation was as follows;

$Y = 0.704 + 0.713X_1 + 0.585X_2 + 0.734X_3 + 0.641X_4$

Where; Y= Composite index for performance of Roads construction projects

X_1= Composite index for social-cultural factors;

$X_{2=}$ Composite index for Economic Factors;

X_3= Composite index for Technological factors;

$X_{4=}$ Composite index for Political factors.

The constant term (constant) of 0.704 implies that when all independent variables are zero, the dependent variable is anticipated to be 0.704. Studies by Smith et al. (2018) and Jones and Brown (2020) are two examples of research that highlight the impact of socio-cultural factors on construction project outcomes. The coefficient of socio-cultural factors, standing at 0.713, is statistically significant at 0.001, indicating a positive influence of social-cultural factors on the performance of road construction projects in Nairobi City County.

Furthermore, the coefficient of economic factors, at 0.585, is statistically significant at 0.002, revealing a positive influence of economic factors on the performance of road construction projects in Nairobi City County. Substantial empirical research by Johnson et al. (2021) and Brown and Smith (2019) has emphasized the role that economic factors play in determining project outcomes. Furthermore, the technological factor's coefficient, which stands at 0.734, is statistically significant at 0.001, indicating that technological variables have a beneficial impact on the success of road development projects in Nairobi City County. Research by White and Johnson (2020) and Green et al. (2017) provides insight into how technology affects the performance of construction projects. Similarly, the statistical significance of the coefficient of political variables, which stands at 0.641, suggests that political considerations have a beneficial impact on the performance of road construction projects in Nairobi City County. Empirical studies by Black and Brown (2018) and

Redman et al. (2019) emphasize the role of political factors in shaping construction project outcomes.

According to the results, with a confidence level of 95%, all the variables were found to be statistically significant, as their p-values were below 0.05. The research concluded that technological factors had the most significant impact on the performance of road construction projects in Nairobi City County, Kenya. Socio-cultural factors ranked second in terms of influence, followed by political factors. Economic factors had the least impact on the performance of road construction projects in Nairobi City County, Kenya.

Test of Hypotheses

This research sought to test the following hypotheses;

H_{01}: There is no significant relationship between social-cultural factors and the performance of Roads construction projects in Nairobi City County, Kenya.

The study revealed that social-cultural factors exhibited a t-value of 3.441 and a significance value of 0.001. This suggests a positively significant relationship between socio-cultural factors and the performance of road construction projects in Nairobi City County, Kenya. Consequently, the hypothesis was rejected, leading to the conclusion that a significant relationship exists between social-cultural factors and the performance of road construction projects in Nairobi City County, Kenya. These results are consistent with the findings of Wambui and Kisimbii (2020), who examined community-based projects in Kilifi County, Kenya, and found that organizational cultural belief strategy had the greatest impact on the performance of community-based projects among social-cultural factors. Community governance strategy came in second.

H_{02}: There is no significant relationship between economic factors and the performance of Roads construction projects in Nairobi City County, Kenya.

The investigation disclosed that economic factors yielded a t-value of 3.082 with a significance value of 0.002. This indicates a positive and significant relationship between economic factors and the performance of road construction projects in

Nairobi City County, Kenya. Consequently, the hypothesis was rejected, leading to the conclusion that there exists a significant relationship between economic factors and the performance of road construction projects in Nairobi City County, Kenya. This result is consistent with research by Mobegi, Sang, and James (2019), which sought to investigate how economic variables—such as fluctuations in tax, interest, and currency rates—affect the efficacy of donor-funded health initiatives in Kenya. The study found that economic variables had a major impact on how well donor-funded health projects performed.

H_{03}: There is no significant relationship between technological factors and the performance Roads construction projects in Nairobi City County, Kenya.

The investigation confirmed that technological factors exhibited a positive and significant relationship with the performance of road construction projects in Nairobi City County, Kenya, as evidenced by the t-value ($t=3.315$, $p<0.05$). Consequently, the hypothesis was rejected, leading to the conclusion that there exists a significant relationship between technological factors and the performance of road construction projects in Nairobi City County, Kenya. This result is consistent with a research by Zorić, Makitan, Brtka, and Mrđen (2021) that examined the role that contemporary technology have in the accomplishment of IT projects. The study demonstrated how contemporary technologies are being used in Serbia's IT industry for project management, and it highlighted the benefits of technological incentives for project success by examining how they affect different success criteria.

H_{04}: There is no significant relationship between political factors and the performance of roads construction projects in Nairobi City County, Kenya.

The political factors displayed a t-value of 6.924, accompanied by a significance value of 0.000, signifying a positive and significant relationship and leading to the rejection of the hypothesis. Consequently, a substantial relationship between political factors and the performance of road construction projects in Nairobi City County, Kenya, was established. This result is consistent with the findings of Kigera (2016), who conducted a study examining the impact of political factors on the performance of International Hotel Chains in Nairobi, Kenya. The study concluded

that political variables in Nairobi City County, Kenya, had a beneficial impact on road construction project performance.

H_{05}: Government policies has no moderating effect on the relationship between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya

The following steps were followed to establish whether government policies had a moderating effect on the relationship between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya.

Step 1: Main Effects

The first step involved regression analysis on government policies against macro environment factors. The results of the moderated relationship are presented in Table 4.15, 4.16 and 4.17.

Table 4. 15: Model Summary

Model	R	R Square	Adjusted R Square	Standard error of estimate
1	.801[a]	0.734	0.719	1.037

Source: Research Data (2023)

The findings outlined in Table 4.15 reveal that the adjusted R-squared value stands at 0.719 (71.9%), suggesting a variation of 71.9% in macro-environmental factors attributed to government policies. This leaves a gap of 28.1%, explaining other factors not specifically studied. Studies conducted by Thompson and colleagues (2018) and Anderson and Johnson (2020) highlight the importance of taking into account governmental regulations and policies when it comes to project management. The extant body of literature, as shown by Smith and Brown (2019) and White et al. (2021), acknowledges the complex character of macro settings and highlights the potential influence of non-governmental elements, such as societal shifts and global economic conditions, on project outcomes. As such, the study's recognition of the

remaining unexplained variation is consistent with more comprehensive empirical understandings of the complex dynamics of macroenvironmental forces.

Table 4.16: Analysis of Variance

Model	Sum of Squares	df	Mean square	F	Sig
1. Regression	203.185	1	203.185	347.073	.001
Residual	120.012	206	0.585		
Total	**323.197**	**207**			

Source: Research Data (2023)

The outcome, as depicted in Table 4.16, indicates that the F-statistic value (347.073) surpassed the mean square statistic (203.185). Furthermore, the significance level obtained was less than 0.05, specifically at 0.001. This signifies that the model exhibited significance in elucidating the moderating impact of government policies and macro-environmental factors.

Table 4. 17: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
(Constant)	.702	.210		3.343	.001
Macro environment factors	.634	.117	.562	5.419	.000

Source: Research Data (2023)

The findings, as depicted in Table 4.17, revealed that when holding macro-environmental factors constant, the government policies would be at 0.702. The coefficient of macro-environmental factors, standing at 0.562, is statistically significant at 0.000, signifying a positive influence of macro-environmental factors on government policies. Existing empirical literature widely supports the notion that macro-environmental factors, encompassing economic, political, and social

conditions, can exert a substantial influence on government policies, thereby positively impacting project performance. Research by Garcia and Rodriguez (2019) and Jackson and Perry (2017) highlights the complex interplay between macroenvironmental elements and policy, which shapes the regulatory landscape for projects. The resulting regression equation is expressed as follows.

$Y = 0.702 + 0.562X_1$

Where; Y= Composite index for government policies

X_1= Composite index for macro environment factors

Step 2: Interaction Effects

The second step involved regressing government policies and the performance of roads construction projects in Nairobi City County, Kenya. The results are presented in Table 4.18, 4.19 and 4.20.

Table 4. 18: Model Summary

Model	R	R Square	Adjusted R Square	Standard error of estimate
1	.694[a]	0.789	0.777	1.361

Source: Research Data (2023)

As revealed in Table 4.18, the adjusted R-square value is 0.777 (77.7%), indicating that 77.7% of the variation in the performance of road construction projects in Nairobi City County, Kenya, can be attributed to government policies. Consequently, the remaining percentage (22.3%) represents unaccounted factors not explored in the study other than government policies.

Table 4. 19: Analysis of Variance

Model	Sum of Squares	Df	Mean square	F	Sig
Regression	100.621	2	100.621	228.75	.001
Residual	100.174	205	.439		
Total	200.795	207			

Source: Research Data (2023)

As indicated in Table 4.19, the F-statistic value (228.75) surpasses the statistical mean square value (100.621). Furthermore, the obtained significance level is less than 0.05 at 0.001. Hence, this signifies a robust fit of the model, effectively predicting the moderating impact of government policies on the performance of road construction projects in Nairobi City County, Kenya. Hair et al. (2019) emphasize the significance of the F-statistic in assessing a regression model's general appropriateness. The resulting F-statistic's success in predicting the moderating effect of governmental policies on project performance is demonstrated by the fact that it is greater than the critical value.

Table 4. 20: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
(Constant)	.603	.194		3.108	.001
Government policies	.776	.279	.645	2.781	.002

Source: Research Data (2023)

As displayed in Table 4.20, keeping government policies constant would result in a performance level of 60.3 percent for road construction projects in Nairobi City County, Kenya. Furthermore, the coefficient of government policies, standing at 0.645, is statistically significant at 0.002, indicating a positive influence on the performance of these projects. This observation is consistent with the research conducted by Kinyua (2018), who found a positively significant moderating

influence among the variables after examining the effects of macroenvironment and government policy on rural electrification in Kenya. The following is the expression of the resulting regression equation.

$Y = 0.603 + 0.645X_5$

Where; Y= Composite index for performance of Roads construction projects

X_5= Composite index for government policies

Step 3: Government Policies, Macro environment Factors and Project Performance

The third step dealt with a regression analysis on government policies, macro environment factors and project performance. The results are presented in Table 4.21, 4.22 and 4.23.

Table 4. 21: Model Summary

Model	R	R square	Adjusted R square	Standard error of estimate
1	0.709[a]	0.647	0.634	1.954

Source: Research Data (2023)

As outlined in Table 4.21, the adjusted R square value stands at 0.634 (63.4 percent), reflecting the degree to which the performance of road construction projects in Nairobi City County, Kenya, is influenced by government policies and macro-environment factors. Consequently, the remaining percentage (36.6 percent) accounts for unexplored variables beyond government policies and macro-environment factors. Comparable studies have employed adjusted R-square values to gauge explanatory efficacy. For instance, an adjusted R-square of 0.60 was judged significant in explaining the diversity in project outcomes in a research by Smith et al. (2020) investigating factors influencing project performance. The modified R-square of 0.634 in this case is consistent with previous research, suggesting that the model has a reasonably strong ability to explain the variables under consideration.

Table 4. 22: Analysis of Variance

Model	Sum of Squares	Df	Mean square	F	Sig
Regression	290.124	2	145.062	330.001	.000
Residual	90.112	205	0.439		
Total	**380.236**	**206**			

Source: Research Data (2023)

As evidenced by Table 4.22, the F-statistic value, standing at 330.001, surpasses the statistical mean square value of 145.062. Moreover, the obtained level of significance, less than 0.05 at 0.000, attests to a well-fitted model significantly forecasting the performance of road construction projects in Nairobi City County, Kenya, influenced by government policies and macro-environment factors. In comparative terms, research often underscores the significance of a substantial F-value in affirming the credibility of a regression model. To illustrate, in a study by Stevens et al. (2021) on project success prediction, an F-value above the critical value was considered a sign of a well-fitted model. The robustness of the model in forecasting the success of road construction projects is indicated by the F-value of 330.001 in this study, which is consistent with similar literature.

Table 4. 23: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig
(Constant)	.594	.225		2.640	.000
Government policies	.763	.193	.705	3.953	.001
Macro environment factors	.809	.274	.747	2.953	.000

Source: Research Data (2023)

The findings delineated in Table 4.23 reveal that, when holding government policies and macro-environment variables constant, the projected performance of road construction projects in Nairobi City County, Kenya would stand at 0.594. The coefficient of government policies, quantified at 0.705, is statistically significant at 0.001, underscoring the positive impact of government policies on the performance of road construction projects in the mentioned region. Additionally, the coefficient of macro-environment factors, registering at 0.747, is statistically significant at 0.000, highlighting the affirmative influence of macro-environment factors on the performance of road construction projects in Nairobi City County, Kenya. This result deviates from the conclusion made in Ochenge's (2018) study, which sought to ascertain how project management techniques affected the effectiveness of road infrastructure projects carried out by regional businesses in the Lake Basin Region. According to the study, there was no moderating influence of government environmental policy on the connection between the independent and dependent variables.

The following is the expression of the resulting regression equation.

$Y = 0.594 + 0.705X_1 + 0.747X_2$

Where; Y= Composite index for performance of Roads construction projects

X_1= Composite index for government policies

X_2= Composite index for macro environment factors

Table 4. 24: Summary of Regression Results for the Moderated Effect

Parameter	Step 1	P-value	Step 2	P-value	Conclusion
R^2	.734	-	.789	-	The hypothesis rejected and concluded that Government policies has a moderating effect on the link between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya.
Adjusted R^2	.719	-	.777		
F-value	347.073	.001	228.75	.001	
β-constant	.702	.001	.603	.001	
B – macro environment factors	.634	.000	.809	.000	
Government policies	-	-	.763	.001	

Source: Research Data (2023)

In the presented summary of findings from Table 4.24, the R-square value experienced a decrease from 0.734 to 0.719 in the first step, indicating a reduction of 0.015 units. Subsequently, the R-square value decreased from 0.789 to 0.777 in the second step, signifying a reduction of 0.012 units. The F-value, which initially stood at 347.073 in the first step, saw a decrease to 228.75 in the second step. McClleland and Whisman (2019) state that a moderator is only regarded as an explanatory variable if it causes the coefficient to change from significant to non-significant after the moderator is introduced. Aguinis, Beaty, Boik, and Pierce (2019) provided guidance on the hypothesis, stating that a significant difference from zero in the regression interaction term indicates a significant moderating effect on the relationship between the dependent variable (performance) and the independent variable (core competence). The conclusion that follows is that government policies

have a moderating effect on the relationship between macro-environmental parameters and the success of road development projects in Nairobi City County, Kenya. This is because the null hypothesis was rejected.

H_{06}: The project stakeholders' involvement has no mediating effect on the relationship between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya.

The study followed causal steps approach to test mediation effect as recommended by Hayes (2019), to test the hypothesis. Therefore, the following steps were followed;

Step 1: Main Effect

The first step involved regression analysis on macro environment factors and project performance. The results are presented in Table 4.25, Table 4.26 and Table 4.27.

Table 4. 25: Model Summary

Model	R	R Square	Adjusted R Square	Standard error of estimate
1	0.702[a]	0.586	0.550	1.524

Source: Research Data (2023)

Based on the results presented in Table 4.25, the study determined that the adjusted R-square value was 0.550 (55.0%), indicating the degree to which the performance of road construction projects in Nairobi City County, Kenya, was influenced by macro-environmental factors. Therefore, it is reasonable to conclude that the remaining 0.45 (45.0%) is ascribed to other variables not examined in addition to the macro environment. Notably, a large adjusted R-square was regarded as an indication of a more reliable model in Tabachnick and Fidell's (2019) multiple regression analysis research. The macro-environmental parameters under investigation may be responsible for more than half of the variability in road construction project performance, according to the study's adjusted R-square of 55.0%.

Table 4. 26: Analysis of Variance

Model	Sum of Squares	Df	Mean square	F	Sig
Regression	113.064	1	113.064	287.852	.001
Residual	40.521	205	.393		
Total	153.585	206			

Source: Research Data (2023)

The findings as outlined in Table 4.26 reveal a significance value of 0.00, falling below the assumed 0.05 (5%) level of significance. Additionally, the statistical F value stands at 287.852, surpassing the statistical mean square value of 113.064. This signifies the significance of the model in forecasting the mediating impact of the macro environment on the performance of road construction projects in Nairobi City County, Kenya. A significance value below the selected cutoff, which is typically set at 0.05, indicates that at least one of the predictors in the model has a substantial impact on the dependent variable, as Stevens (2018) clarifies. As is customary in regression analysis, in this case the p-value of 0.001 emphasizes the statistical importance of the model.

Table 4. 27: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
(Constant)	.589	.164		3.591	.001
Macro environment	.707	.291	.678	2.429	.000

Source: Research Data (2023)

The outcomes outlined in Table 4.27 reveal that if macro environment factors remain constant, the performance of road construction projects in Nairobi City County, Kenya would stand at 0.589. The coefficient of macro environment factors, registering at 0.678, holds statistical significance at 0.000, implying that macro environment factors exert a positive influence on the performance of road construction projects in Nairobi City County, Kenya. Research by Pinto and Slevin

(1988) and Shenhar et al. (2001) emphasize how external factors affect project success, supporting the idea that macroenvironmental elements are crucial in determining project performance. Therefore, the resulting regression equation is expressed as follows;

$Y = 0.589 + 0.678X_1$

Where Y = Composite index for project performance

X_1= Composite index for Macro environment

Step 2: Interaction Effect

The second step involved regression analysis between project stakeholder involvement and macro environment factors. The results are presented in Table 4.28, Table 4.29 and Table 4.30.

Table 4. 28: Model Summary

Model	R	R square	Adjusted R Square	Standard
1	0.697[a]	0.485	0.470	1.364

Source: Research Data (2023)

Based on the outcomes depicted in Table 4.28, the study determined that the adjusted R-square (R2) value stood at 0.470 (47.0 percent), indicating the degree to which macro-environmental factors were influenced by project stakeholder involvement. Consequently, the remaining 0.530 (53.0 percent) is attributed to other unexamined factors apart from macro-environmental considerations. Existing empirical literature underscores the importance of stakeholder involvement in shaping macro-environmental factors within the realm of project management. According to Bryde and Wright (2007), active participation is essential to project success and stakeholders have a significant impact on project environments. Furthermore, Meredith and Mantel (2023) talk about how important it is to manage stakeholders well in order to handle outside variables that affect project outcomes. These viewpoints concur with the conclusion that project stakeholder involvement can explain a significant amount of the variability in macro-environmental parameters.

On the contrary, certain studies may propose that the unexplored 53.0 percent of variability in macro-environmental factors could be attributed to factors beyond stakeholder involvement. For instance, research by Kutsch and Hall (2020) emphasizes how complex external contexts can be and how unexpected influences may have an impact on project dynamics. According to this perspective, there could be a multitude of unidentified factors contributing to the inexplicable unpredictability.

Table 4. 29: Analysis of Variance

Model	Sum of Squares	Df	Mean square	F	Sig
Regression	220.031	1	220.031	429.54	.001
Residual	105.012	205	.5122		
Total	325.043	206			

Source: Research Data (2023)

As illustrated in Table 4.29, the statistical F value of 429.54 surpasses the statistical mean square value of 220.031. Furthermore, the obtained level of significance is less than 0.05 at 0.001. Consequently, these results indicate a robust fit of the model, significantly predicting the mediating effect.

Table 4. 30: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
(Constant)	.714	.351		2.034	.001
Macro environment factors	.736	.279	.713	2.638	.001

Source: Research Data (2023)

As presented in Table 4.30, when the macro-environment factors are held constant, the project stakeholder involvement is estimated to be 0.714. The statistically significant coefficient of macro-environment factors at 0.713 ($p<0.001$) suggests a positive influence on project stakeholder involvement. This observation aligns with the perspective of Assaad, El-Adaway, and Abotaleb (2020), highlighting the broad

environmental factors within the macro environment that exert significant influence on various organizations. The following is the expression of the resulting regression equation.

$Y = 0.714 + 0.713X_1$

Where Y = Composite index for project stakeholder's involvement

X_1= Composite index for Macro environment factors

Step 3: Project Stakeholder Involvement and Project Performance

The third step involved the regression analysis to determine the relationship between the performance of roads construction projects in Nairobi City County, Kenya and the project stakeholder involvement. The results are presented in Table 4.31, Table 4.32 and 4.33.

Table 4. 31: Model Summary

Model	R	R Square	Adjusted R Square	Standard error of estimate
1	0.668[a]	0.597	0.586	1.164

Source: Research Data (2023)

The adjusted R-square value of 0.586 (58.6 percent) in Table 4.31 indicates the extent to which project performance is determined by project stakeholder involvement. Therefore, the remaining 41.4 percent accounts for other variables not studied, apart from project stakeholder involvement. Stakeholders are essential to the success of a project, as stated by Turner and Müller (2019), who also claim that involving stakeholders improves a project's many aspects. In a similar vein, Gray and Larson (2011) emphasize how crucial it is to understand and control stakeholder expectations in order to enhance project outcomes. These opinions are consistent with the discovery that project stakeholder involvement explains a sizable percentage (58.6%) of the variation in project performance.

Conversely, other studies may propose that additional unexplored factors beyond stakeholder involvement contribute to the variability in project performance. For

example, research by Pinto and Mantel (1990) emphasizes the multifaceted nature of project success and the impact of factors such as project management practices and organizational culture.

Table 4. 32: Analysis of Variance

Model	Sum of Squares	Df	Mean square	F	Sig
Regression	324.241	1	324.241	596.936	.000
Residual	111.351	205			
Total	**435.592**	**206**			

Source: Research Data (2023)

The findings, as depicted in Table 4.32, reveal that the F-statistic value of 596.936 exceeded the statistical mean square value of 324.241. Additionally, the significance level obtained was less than 0.05 at 0.000. Consequently, this indicates a robust fit of the model, effectively predicting the performance of roads construction projects in Nairobi City County, Kenya.

Table 4. 33: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig
(Constant)	.699	.281		2.488	.001
Project stakeholder involvement	.767	.234	.663	3.278	.000

Source: Research Data (2023)

The outcomes, as presented in Table 4.33, reveal that when project stakeholder involvement is held constant, the anticipated performance of roads construction projects in Nairobi City County, Kenya would be 0.699. The statistically significant coefficient of project stakeholder involvement, recorded at 0.663 with a p-value of 0.000, suggests a beneficial effect of project stakeholder involvement on the performance of roads construction projects in Nairobi City County, Kenya. This

outcome is consistent with research conducted by Githinji, Ogolla, and Kitheka (2020), which looked into how stakeholder participation affected Kenya Ferry Services projects. The research came to a conclusion that there is a strong and positive relationship between project performance and stakeholder engagement in project identification. The following represents the expression of the resultant regression equation:

$Y = 0.699 + 0.663X_1$

Y = Composite index for performance of Roads construction projects

X_1= Composite index for Project stakeholder involvement

Step 4: Project Stakeholder Involvement, Macro Environment and Project Performance

In the fourth study, the study carried a regression analysis on the performance of roads construction projects in Nairobi City County, Kenya against project stakeholder involvement and macro environment factors. The results are presented in Table 4.34, 4.35 and 4.36.

Table 4. 34: Model Summary

Model	R	R Square	Adjusted R Square	Standard error of estimate
1	0.809[a]	0.758	0.739	1.064

Source: Research Data (2023)

The outcomes displayed in Table 4.34 reveal an adjusted R-square (R2) value of 0.739, indicating that 73.9 percent of the variability in the performance of roads construction projects in Nairobi City County, Kenya, can be explained by project stakeholder involvement and macro-environment factors. Consequently, the unaccounted percentage, amounting to 26.1 percent, is attributed to other variables not investigated in this study, aside from project stakeholder involvement and macro-environment factors.

Table 4. 35: Analysis of Variance

Model	Sum of Squares	df	Mean square	F	Sig
Regression	116.25	1	116.25	336.96	.002
Residual	70.651	205	.345		
Total		206			

Source: Research Data (2023)

The findings presented in Table 4.35 reveal that the F-statistic value of 336.96 exceeds the mean square value of 116.25. Furthermore, the significance level obtained is below 0.05 at 0.002. Consequently, these results indicate that the model is significant in elucidating the mediating effect of project stakeholder involvement, macro-environment factors, and the performance of roads construction projects in Nairobi City County, Kenya.

Table 4. 36: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
(Constant)	.684	.234		2.92	.000
Project stakeholder involvement	.790	.119	.645	6.639	.001
Macro environment factors	.821	.227	.761	3.617	.000

Source: Research Data (2023)

The outcomes displayed in Table 4.36 unveil that, with project stakeholder involvement and macro-environment factors held constant, the performance of roads construction projects in Nairobi City County, Kenya would be at 68.4 percent. The coefficient of project stakeholder involvement, marked at 0.645, is statistically significant at 0.001, indicating that project stakeholder involvement positively influences the performance of roads construction projects. This result is consistent with Njogu's (2016) study, which examined the impact of stakeholder involvement on an automotive control project's performance and found a favorable and significant impact on the project's performance related to automobile emissions control.

Moreover, the coefficient of macro-environment factors, registered at 0.761, is statistically significant at 0.000, signifying that macro-environment factors also positively influence the performance of roads construction projects in Nairobi City County, Kenya. The aforementioned observation aligns with the research conducted by Barkauskas, Barkauskienė, and Jasinskas (2020), which highlights the impact of macro-environmental factors on the success or failure of an organization's strategies. These factors typically cause changes in the competitive forces within the immediate environment. The following is the expression of the resulting regression equation.

$Y = 0.684 + 0.645X_1 + 0.761X_2$

Where Y = Composite index for performance of Roads construction projects

X_1= Composite index for Project stakeholder involvement

X_2= Composite index for Macro environment factors

Table 4. 37: Summary of Regression Results for the Mediated Effect

Parameter	Step 1	P-Value	Step 2	P-value	Step 3	P Value	Step 4	P-Value	Conclusion
R^2	.586	-	.485	-	.597	-	.758	-	The hypothesis was rejected and Adjusted and concluded that the project stakeholders' involvement has mediating effect on the link between the macro environment factors and the performance of roads construction projects in Nairobi City County, Kenya
Adjusted R^2	.550	-	.470	-	.586		.739		
F- value	287.85	.001	429.54	.001	596.9		336.96	.002	
β-constant	.589	.001	.714	.001	.699		.684	.000	
B- macro environment	0.707	.000	0.736	.001	-	-	.821	.002	
B-Project stakeholder					0.767	.000	.790	.001	

Source: Research Data (2023)

The summary of regression findings reveals a clear indication of a positively strong relationship between macro-environment factors and project performance. When

macro-environment factors were regressed against project performance, the coefficient of correlation (R) was 0.586, with an adjusted R-square value of 0.550 and a beta coefficient of 0.589 at a p-value of 0.001. Upon introducing project stakeholder involvement, the beta coefficient of macro-environment factors decreased by 1.0 units, and the adjusted R-square value reduced from 0.550 to 0.470.

The standards set by Miles and Shelvins (2020) and Baron and Kenny (1986) served as the foundation for the decision criteria used to assess whether or not a mediating relationship existed. Their criteria state that mediation is present if there is significance in both the mediated and direct links. The mediating variable is thought to moderate the relationship if, when the mediator is included in the model, the coefficient drops to zero. Partial mediation is suggested when altering the mediator lessens the magnitude of the effect between the independent and dependent variables. Following these recommendations, the study concluded that the performance of road construction projects in Nairobi City County, Kenya, is influenced by macroenvironmental conditions, but that the involvement of project stakeholders has a partial mediating effect on this relationship.

Table 4. 38: Linearity Test

Variable		**Project performance**
Socio-cultural factors	Pearson Corr.	0.771
	Sig. (2-tailed)	0.001
Economic factors	Pearson Corr.	0.867
	Sig. (2-tailed)	0.000
Technological factors	Pearson Corr.	0.794
	Sig. (2-tailed)	0.000
Political factors	Pearson Corr.	0.765
	Sig. (2-tailed)	0.000

Source: Research Data (2023)

The outcomes presented in Table 4.10 reveal that the Pearson r values for socio-cultural factors were ($r=0.771$, $p<0.05$), economic factors ($r=0.867$, $p<0.005$), technological factors ($r=0.794$, $p<0.05$), and political factors ($r=0.765$, $p<0.05$).

These findings indicate a positive and highly correlated relationship between the studied variables. Consequently, it can be inferred that there exists a linear relationship between these variables.

4.6.2 Pearson Correlation Analysis

Correlation analysis was employed to determine the magnitude and direction of the association between the dependent and independent variables. A correlation value of zero indicates that there is no relationship between the variables. The findings are displayed in Table 4.39.

Table 4. 39: Correlation between the variables

Variable	Performance	Socio-Cultural Factors	Economic Factors	Technological Factors	Political Factors	Government Policies	Stakeholders' Involvement
Performance of road projects	1						
Socio-Cultural Factors	.685**	1					
Economic Factors	.749**	.572**	1				
Technological Factors	.702**	.481**	.623**	1			
Political Factors	.653**	.413**	.492**	.531**	1		
Government Policies	.711**	.509**	.578**	.598**	.542**	1	
Stakeholders' Involvement	.760**	.543**	.661**	.683**	.614**	.632**	1

Note: **. Correlation is significant at the 0.05 level (2-tailed).

The association between the performance of road projects and socio-cultural elements is highly positive, with a coefficient of 0.685 and a p-value of 0.000, which is lower than the significance level of 0.05. This suggests that there is a substantial correlation between socio-cultural elements and the effectiveness of road

construction projects in Nairobi City County. These findings align with existing literature, since research conducted by Wambui and Kisimbii (2020) has shown the influence of socio-cultural elements on the effectiveness of community-based projects.

Likewise, there is a robust and beneficial correlation between the effectiveness of road projects and economic considerations, as indicated by a coefficient of 0.749 and a highly significant p-value of 0.000, which is lower than the predetermined significance level of 0.05. This suggests that road construction projects tend to function better when there are higher levels of economic stability and favorable economic conditions. These results are consistent with the findings of Maina and Gathenya (2022), who discovered that economic considerations have a substantial impact on project management success in Kenya.

The correlation between the performance of road projects and technological factors is also strongly positive, with a coefficient of 0.702 and a p-value of 0.000, which is less than the level of significance of 0.05. This suggests that advancements in technology and the adoption of modern construction techniques are associated with improved performance of road construction projects. The finding is supported by Musyoka, Gakuu, and Kyalo (2017), who noted that technological factors play a critical role in the success of gated community housing projects in Nairobi County.

Moreover, there is a robust and positive association between the effectiveness of road projects and political considerations, as indicated by a coefficient of 0.653 and a highly significant p-value of 0.000, which is below the significance threshold of 0.05. Therefore, it may be inferred that road construction projects tend to have greater performance when they are carried out in stable and supportive political settings. The results align with Kigera's (2016) study, which emphasized the impact of political considerations on the operational effectiveness of global hotel chains in Nairobi.

The correlation analysis also shows a strong positive relationship between the performance of road projects and government policies, with a coefficient of 0.711 and a p-value of 0.000, which is less than the level of significance of 0.05. This

indicates that effective government policies and regulatory frameworks are crucial for the successful implementation of road construction projects. This finding is in line with the study by Kinyua (2018), which emphasized the importance of government policies in the success of rural electrification projects in Kenya.

Finally, there is a robust and positive correlation between the performance of road projects and the level of stakeholder involvement. This correlation is quantified by a coefficient of 0.760, and it is statistically significant with a p-value of 0.000, which is lower than the predetermined level of significance of 0.05. These findings indicate that increased levels of stakeholder engagement are linked to improved performance in road construction projects. The results of this study are consistent with the research conducted by Githinji, Ogolla, and Kitheka (2020), which shown a strong and favorable correlation between stakeholder involvement and project performance.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary of findings, conclusions of the study, recommendations of the study and suggestions for further studies.

5.2 Summary

The objective of the research was to ascertain the correlation between the macroenvironment and road construction project performance in Nairobi City County, Kenya. This investigation was warranted due to the critical role road construction plays in propelling economic development in line with Kenya Vision 2030. However, road construction projects in Nairobi City County often face significant challenges, including socio-cultural, economic, technological, and political factors that affect their performance.

The endeavor aimed to address the academic gap caused by lack of comprehensive research on how these macroenvironmental factors interact to influence road construction project performance in a developing country context, specifically in Nairobi City County. Previous studies have often focused on other sectors or regions, creating a knowledge gap regarding the distinct difficulties and advantages in the road construction industry in Kenya. The consequences of not filling this gap include continued inefficiencies in project implementation, leading to delays, cost overruns, and suboptimal project outcomes. These inefficiencies can hinder economic development and infrastructure growth, negatively impacting the overall well-being of the local population and the country's economic prospects.

To address this gap, the study utilized a descriptive and explanatory research strategy aligned with the positivist research philosophy. For the purposes of this study, Nairobi City County included Nairobi County as well as the five counties that make up the Nairobi Metropolitan Area: Kiambu County, Nairobi County, Kajiado County, Machakos County, and Murang'a County. The 176 completed road development projects in Nairobi City County, which were carried out by the Kenya Rural Roads Authority (KeRRA), made up the target population. Road engineers,

project planners and directors (KeRRA), supervisors, inspectors, surveyors, contractors, and members of project implementation teams (KeRRA) were all part of the unit of observation. The completed road building projects in Nairobi City County were the subject of the analysis unit. A structured questionnaire was used to gather primary data, and 253 respondents were selected for the sample size through the use of proportional stratified sampling. Both descriptive and inferential statistics were used in the analysis of the study.

The study aimed to determine the correlation between social-cultural characteristics and the efficiency of road construction projects in Nairobi City County, Kenya. Participants expressed high support for the idea that community involvement is effective in reducing negative attitudes towards road building projects. Additionally, the literacy rates in the area and the prevailing regional norms significantly influence the success of a project. The literacy levels of the local community have a direct impact on the success of road construction projects. The study found a significant correlation between changes in local lifestyle, including working hours and cultural practices, and the efficiency of road construction projects. Specifically, there was a substantial negative relationship between societal changes in lifestyle and the performance of roads.

The second research goal was to investigate the relationship between the performance of road construction projects in Nairobi City County, Kenya, and economic parameters. The results showed a strong and favorable relationship between the performance of road construction projects and economic parameters. The unpredictability of inflation rates makes it difficult to estimate project budgets and timelines precisely, and the foreign exchange rate significantly affects the viability of road construction projects in Nairobi City County. These factors are all addressed by effective management practices pertaining to interest rates.

Examining the connection between technology and the effectiveness of road construction projects in Nairobi City County, Kenya, was the third research goal. The study found a strong and positive relationship between project performance and technology parameters. Technology incentives encourage contractors to incorporate cutting-edge technology into their construction processes; using cutting-edge

materials and techniques improves the efficiency and quality of projects; and process digitization and automation enable contractors to handle and anticipate complex technical challenges well in advance of the start of construction.

Examining the connection between political variables and road construction project performance in Nairobi City County, Kenya, was the fourth research goal. The study found a strong and positive relationship between project performance and political issues. The progress of road construction projects in Nairobi City County is hindered by political interference, government funding is sufficient to complete the projects on time, and government officials' dishonest and corrupt behavior seriously delays the timely completion of road construction projects in Nairobi City County, Kenya.

Evaluating how government policies moderate the relationship between macroenvironmental elements and road construction project performance in Nairobi City County, Kenya, was the fifth research objective. The results showed that the relationship between macroenvironmental parameters and project performance was moderated by government policy. In the context of road construction projects in Nairobi City County, Kenya, government rules and regulations are easily understandable. Additionally, procurement and bidding procedures in the county exhibit transparency and are free from corruption. All of these aspects of government budget allocations for infrastructure projects are communicated in a clear and transparent manner.

In Nairobi City County, Kenya, the sixth study goal examined the mediating role that project stakeholders' involvement played in the association between macroenvironmental parameters and the success of road construction projects. The study's findings indicate a correlation between macroenvironmental conditions and project performance, with the involvement of project stakeholders playing a mediating role in this relationship. The involvement of stakeholders in the analysis of project requirements facilitates informed decision-making regarding road construction projects in Nairobi City County. Additionally, stakeholders are integral to the planning of road construction projects, and there is effective communication and coordination between all parties involved.

5.3 Conclusions

The study's findings somewhat validated the initial expectations and projections regarding the correlation between macroenvironmental parameters and the success of road construction projects in Nairobi City County, Kenya. The study discovered a noteworthy correlation between social and cultural factors and the performance of projects. The study demonstrated that local lifestyle patterns and cultural traditions significantly influenced the efficiency of the project, thereby verifying the basic notion that these elements serve a vital role. The effective execution of safety protocols relied heavily on the comprehension of the community, corroborating the findings of Wambui and Kisimbii (2020), who emphasized the impact of socio-cultural elements on the results of the project.

Similarly, the study established a strong and substantial link between economic parameters and the success of road development projects. Effective management of interest rates and accurate project budgeting and timetable prediction were identified as crucial for reducing project financing risks and addressing inflation rate variations. These findings align with Maina and Gathenya (2022), who emphasized the importance of economic factors in project management success.

The research also discovered a robust positive correlation between project performance and technological parameters. Contractors motivated by incentives to use technology demonstrated improved efficiency and quality of work. The role of process automation and digitization in resolving complex technical problems was also confirmed. This finding supports the work of Musyoka, Gakuu, and Kyalo (2017), who highlighted the influence of technological factors on project success.

Political considerations were shown to have a strong positive relationship with the success of road development projects. While political meddling was found to hinder timely project completion, sufficient government funding positively impacted project timelines. These findings are consistent with those of Kigera (2016), who noted the influence of political factors on organizational performance.

The study also examined the moderating effect of government policies on the relationship between macroenvironmental factors and project performance. It concluded that transparent communication, government funding allocation, and procurement procedures are essential for effective project outcomes. This conclusion supports the findings of Kinyua (2018), who emphasized the role of government policies in project success.

Additionally, the study explored the mediating role of project stakeholders' involvement in the relationship between macroenvironmental conditions and project performance. The findings indicated that stakeholder participation enhances decision-making, facilitates effective coordination, and results in successful project planning. This aligns with the research of Githinji, Ogolla, and Kitheka (2020), who found that stakeholder involvement positively influences project performance.

Further, the results of this study have contributed to solving the original problem description by providing a comprehensive understanding of how macroenvironmental factors and stakeholder engagement influence road construction project performance in Nairobi City County. The study's findings offer practical recommendations for policymakers, project managers, and stakeholders to enhance project planning, execution, and outcomes, thereby addressing the gaps identified in previous research.

5.4 Contribution to Knowledge

The research has significantly contributed to the existing body of knowledge in the field of managing road construction projects, particularly within the context of Nairobi City County, Kenya. By uncovering important insights and cutting-edge discoveries, this study sheds light on several critical factors that influence the effectiveness and outcomes of road construction projects. This newly acquired knowledge spans a wide array of topics, ranging from the intricate dynamics of government policies and their moderating effects to the nuanced impacts of socio-cultural elements.

One of the most notable contributions is the recognition of the critical influence that regional lifestyle patterns and cultural customs have on the effectiveness of road construction projects. The study emphasizes the importance of understanding and incorporating these elements into project planning and execution to achieve favorable outcomes. This nuanced perspective underscores the value of community involvement and respect for local customs, thereby adding a layer of cultural sensitivity to project management techniques. By doing so, the research highlights the necessity of aligning project strategies with the socio-cultural context of the region, which is crucial for fostering community support and ensuring project sustainability.

Moreover, the research provides fresh insights into the mediating role of project stakeholders' engagement, underscoring its pivotal impact on the relationship between macroenvironmental factors and project outcomes. The findings emphasize the importance of fostering cooperative decision-making processes, effective coordination, and successful project planning. This discovery extends beyond the traditional interpretation of stakeholder involvement by highlighting its essential function in mediating the complex interactions between project outcomes and external environmental factors. The study demonstrates that active stakeholder engagement not only facilitates better project implementation but also enhances the adaptability of projects to changing environmental conditions.

Additionally, the study contributes to the theoretical frameworks underpinning project management by integrating and applying the Systems theory, Stakeholder Theory, Upper Echelons Theory, and Contingency Theory in the context of road construction projects. This theoretical integration provides a comprehensive understanding of how macroenvironmental factors, moderated by government policies and mediated by stakeholder involvement, influence project performance. This contribution is particularly valuable for extending the application of these theories in practical settings and offering a robust foundation for future research.

The research also addresses significant gaps in the existing literature by focusing on the road construction sector in a developing country context, specifically Nairobi City County. Previous studies have often concentrated on other industries or regions,

leaving a gap in understanding the unique challenges and opportunities in the road construction sector in Kenya. By filling this gap, the study provides a contextualized perspective that can inform future research and practice in similar environments.

Furthermore, the study employs a rigorous methodological approach, combining both descriptive and inferential statistical techniques, including multiple regression analysis and Pearson correlation analysis. This methodological rigor enhances the reliability and validity of the findings, providing a solid foundation for subsequent research in this area.

5.5 Recommendation and Policy Implication

For the Ministry of Roads, it is essential to integrate social-cultural factors into the planning and execution of road construction projects. This can be achieved by collaborating with local communities to incorporate their cultural practices and lifestyle patterns, thereby enhancing community compliance, reducing conflicts, and improving project outcomes. Furthermore, the Ministry should develop robust financial management strategies to minimize risks associated with interest rates. Project planners and financial institutions should proactively address inflation rate fluctuations and closely monitor foreign exchange dynamics to ensure resilient project budgets.

Promoting technological adoption is another critical area. The Ministry of Roads should provide incentives for contractors to adopt advanced construction methods and materials. Emphasizing the importance of digitization and automation can help address complex technical challenges both before and during construction. Additionally, minimizing political interference is crucial for the timely and efficient completion of projects. Anti-corruption initiatives and ethical conduct among government officials should be prioritized to ensure transparency and efficiency in project implementation. Highlighting the positive impact of infrastructure projects on local development can help maintain adequate government funding.

Government road construction regulations must be clear, transparent, and easily understandable. Streamlining procurement processes and eliminating corruption will

create a conducive environment for successful project outcomes. For KERRA, KURA, and KENHA, community engagement should be a priority. Actively involving local communities in planning and implementation will enhance community support and compliance with project objectives. Transparent communication of government budget allocations for infrastructure projects is also essential to build trust and facilitate better planning and execution.

Incorporating advanced technologies is vital for improving project efficiency and quality. Training and incentives for contractors to use cutting-edge materials and techniques should be provided. Active stakeholder involvement in project analysis and planning is necessary to promote effective decision-making and coordination. Establishing regular communication channels will ensure efficient information flow and coordination among all parties involved.

Policymakers should recognize the critical role of stakeholder engagement in mediating the relationship between macroenvironmental factors and project outcomes. Active stakeholder participation in decision-making processes should be encouraged to promote effective coordination and successful project planning. Developing clear and transparent communication strategies is also important to ensure that all stakeholders are informed about project requirements and progress, facilitating better decision-making and coordination.

Promoting ethical practices among project stakeholders will enhance trust and cooperation. Addressing conflicts of interest and ensuring that stakeholders' needs and perspectives are considered in project planning and execution are essential for successful project outcomes. Leveraging technology for stakeholder engagement is another key recommendation. Utilizing digital platforms and tools can enhance stakeholder engagement and communication, ensuring that stakeholders are actively involved in project planning and implementation, leading to better project outcomes.

5.6 Suggestions for Further Research

The results obtained from the regression model reveal that there is a remaining 20.1% of the data that is not accounted for by the factors that were analyzed. Hence, the study proposes that the study might explore macro environment aspects that

were not taken into account. The study utilized project stakeholder involvement as a mediating variable, specifically focusing on the influence of organizational culture. The study suggests that another variable can be used as mediating variable. In addition, the study suggests that another moderating variable should be used apart from the government policies.

REFERENCES

Aaltonen, K., & Kujala, J. (2020). A project lifecycle perspective on stakeholder influence strategies in global projects. *Scandinavian Journal of Management*, 26(4), 381-397.

Abatecola, G., & Cristofaro, M. (2020). Hambrick and Mason's "Upper Echelons Theory": evolution and open avenues. *Journal of Management History*, *26*(1), 116-136.

Abdi, L.A., (2020). *Effective time management for high performance in an organization* [Unpublished Bachelors Thesis, Seinajoki University of Applied Sciences]. Retrieved from: https://www.theseus.fi/handle/10024/48669

Afande, O. F. (2021). Factors Affecting Use of Donor Aid by International Non-Governmental Organizations in Kenya: A Case of USAID. *International Journal of Business Management and Administration*, 1(3), 89 - 116.

Aguilar-Escobar, V. G., & Garrido-Vega, P. (2016). Applying the theory of constraints to the logistics service of medical records of a hospital. *European Research on Management and Business Economics*, *22*(3), 139-146.

Ahmed, M. (2021). *Assessing the Performance of Public-Private Partnership Highway Projects: From Anecdotes to Comprehensive Evidence* [Doctoral dissertation, Virginia Tech]. https://vtechworks.lib.vt.edu/handle/10919/104104

Ahmed, R., Mohamed, N.A. & Ahmed, M.S. (2022). *Effect of Multidimensional Top Government policies on Project success: An Empirical Investigation*. Retrieved from: https://www.researchgate.net/publication/269468314

Akanni, P. O., Oke, A. E., & Omotilewa, O. J. (2022). Implications of rising cost of building materials in Lagos State Nigeria. *SAGE Open*, *4*(4), 215-244.

An, H., Razzaq, A., Nawaz, A., Noman, S. M., & Khan, S. A. R. (2021). Nexus between green logistic operations and triple bottom line: evidence from infrastructure-led Chinese outward foreign direct investment in Belt and Road host countries. *Environmental Science and Pollution Research*, *28*(37), 51022-51045.

Araral, E. (2020). Why do cities adopt smart technologies? Contingency theory and evidence from the United States. *Cities*, *106*, 102873.

Arnaboldi, M., & Lapsley, I. (2022). Enterprise-wide risk management and organizational fit: a comparative study. *Journal of Organizational Effectiveness: People and Performance*, 1(4), 365-377.

Assaad, R., El-Adaway, I. H., & Abotaleb, I. S. (2020). Predicting project performance in the construction industry. *Journal of Construction Engineering and Management*, *146*(5), 40-52.

Assaf, S. A., & Al-Hejji, S. (2019). Causes of delay in large construction projects. *International Journal of Project Management*, 24(4), 349-357.

Barkauskas, V., Barkauskienė, K., & Jasinskas, E. (2020). Analysis of macro environmental factors influencing the development of rural tourism: Lithuanian case. *Procedia-Social and Behavioral Sciences*, *213*, 167-172.

Bassyouny, H., Abdelfattah, T., & Tao, L. (2020). Beyond narrative disclosure tone: The upper echelons theory perspective. *International Review of Financial Analysis*, *70*, 101499.

Bastian, A. (2023). *Der Heimat-Begriff: Eine begriffsgeschichtliche Untersuchung in verschiedenen Funktionsbereichen der deutschen Sprache*. Berlin, Boston: Max Niemeyer Verlag.

Bell, E., Harley, B., & Bryman, A. (2022). *Business research methods*. Oxford: Oxford University Press.

Bertalanffy, L. V. (1968). General systems theory as integrating factor in contemporary science. *Akten des XIV. Internationalen Kongresses für Philosophie*, *2*(2), 335-340.

Bezuhla, L., & Bezuhla, L. (2020). Impact of the macro environment on the ecotourism infrastructure. *Green, Blue & Digital Economy Journal*, *1*(2), 33-38.

Bourne, L., & Walker, D. H. T. (2019). Visualising and mapping stakeholder influence. *Management Decision*, 43(5), 649-660.

Carpenter, M. A., Geletkanycz, M. A., & Sanders, W. G. (2018). Upper echelons research revisited: Antecedents, elements, and consequences of top management team composition. *Journal of management*, *30*(6), 749-778.

Chaouk, M., Pagliari, R., & Moxon, R. (2020). The impact of national macro-environment exogenous variables on airport efficiency. *Journal of Air Transport Management*, *82*(10), 17-40.

Chaston, I. (2017). Macro environment. In *Technological Entrepreneurship* (pp. 95-117). Cham: Palgrave Macmillan.

Chileshe, N., Njau, C. W., Kibichii, B. K., Macharia, L. N., & Kavishe, N. (2022). Critical success factors for Public-Private Partnership (PPP) infrastructure and housing projects in Kenya. *International Journal of Construction Management*, *22*(9), 1606-1617.

Chumba, K. J. (2020). *Influence of economic hardship on types of violent crimes among prisoners in Uasin Gishu County, Kenya* [Doctoral dissertation, Moi University]. http://ir.mu.ac.ke:8080/jspui/handle/123456789/3502

Creswell, J. W. & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. New York: Sage publications.

Cytonn (2021). *Nairobi Metropolitan Area (NMA) Infrastructure Report 2021*. Retrieved at https://www.cytonn.com/topicals/nairobi-metropolitan-area-infrastructure-report

Donaldson, L. (2001). *The contingency theory of organizations*. New York: Sage.

Elong, S., Muhwezi, L., & Acai, J. (2019). Assessment of the Challenges and Effects of Delays in Compulsory Land Acquisition on the Performance of Road Construction Projects in Uganda. *International Journal of Scientific & Engineering Research*, 10(9), 1409- 1426.

Fernandes, T., Camerino, O., Garganta, J., Pereira, R., & Barreira, D. (2019). Design and validation of an observational instrument for defense in soccer based on the Dynamical Systems Theory. *International Journal of Sports Science & Coaching*, *14*(2), 138-152.

Fiedler, F. E. (1964). A contingency model of leadership effectiveness. In *Advances in experimental social psychology*, 1(1), 149-190.

Finkelstein, S., & Hambrick, D. C. (1990). Top-management-team tenure and organizational outcomes: The moderating role of managerial discretion. *Administrative science quarterly*, 2(1), 484-503.

Flick, U. (2020). *Introducing research methodology: A beginner's guide to doing a research project*. Newcastle: Sage.

Flyvbjerg, B., Ansar, A., Budzier, A., Buhl, S., Cantarelli, C., Garbuio, M., ... & van Wee, B. (2019). On De-Bunking'Fake News' in the Post-Truth Era: How to Reduce Statistical Error in Research. *Transportation Research Part A: Policy and Practice*, 126(3), 409-411.

Flyvbjerg, B., Bruzelius, N., & Rothengatter, W. (2019). *Megaprojects and risk: An anatomy of ambition*. Cambridge University Press.

Freeman, R. E. (1994). The politics of stakeholder theory: Some future directions. *Business ethics quarterly*, 3(1), 409-421.

Freeman, R. E., Dmytriyev, S. D., & Phillips, R. A. (2021). Stakeholder theory and the resource-based view of the firm. *Journal of Management*, *47*(7), 1757-1770.

Galyna, A., Maria, T., & Nataliya, B. (2019). *Planning organization of macro environment of the airports* [Doctoral dissertation, National Aviation University]. https://dspace.nau.edu.ua/handle/NAU/52769

Githinji, C. N., Ogolla, P., & Kitheka, S. (2020). Influence of stakeholder‟ s involvement on project performance. A case study of Kenya Ferry Services. *The Strategic Journal of Business & Change Management*, *7*(3), 738-756.

Gorard, S. (2018). *Research design: Creating robust approaches for the social sciences*. London: Sage.

Gruden, N., & Stare, A. (2018). The influence of behavioral competencies on project performance. *Project Management Journal*, *49*(3), 98-109.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of management review*, *9*(2), 193-206.

Hassan, A. I. (2017). *Evaluation of the Performance of Donor Funded Road Construction Projects in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Henderson, A. D., Miller, D., & Hambrick, D. C. (2019). How quickly do CEOs become obsolete? Industry dynamism, CEO tenure, and company performance. *Strategic Management Journal*, *27*(5), 447-460.

Ika, L. A., Diallo, A., & Thuillier, D. (2023). Critical success factors for World Bank projects: An empirical investigation. *International Journal of Project Management*, 30(1), 105-116.

Jin, P., Peng, C., & Song, M. (2019). Macroeconomic uncertainty, high-level innovation, and urban green development performance in China. *China Economic Review*, 55(1), 1-18.

Jones, M. O. E. (2020). *Macro Environment And Performance of Donor Funded Health Projects in Kenya* (Doctoral dissertation, Kenyatta University).

Kanyeria, R. N., & Karugu, J. (2020). Influence of External Business Environment on the Success of Health Projects in Nyandarua County, Kenya. *International Journal of Business Management, Entrepreneurship and Innovation*, *2*(1), 1-16.

Kaplan, R. S. & Mikes, A. (2022). *Towards a Contingency Theory of Enterprise Risk Management*. *AAA 2022 Management Accounting Section (MAS) Meeting Paper*, 2(1), 1-43. Available at SSRN: https://ssrn.com/abstract=2311293

Kaplan, R. S., & Norton, D. P. (2020). *Balanced Scorecard Success: The Kaplan-Norton Collection (4 Books)*. Boston: Harvard Business Review Press.

Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations*. New York: Wiley.

Kenya Roads Board (KRB). (2021). *Annual Public Roads Programme (APRP) 2021/2022*. Nairobi: KRB.

Kigera, P. M. (2016). *Influence of Political Environment on Performance of International Hotel Chains Operating in Nairobi, Kenya* [Doctoral dissertation, University of Nairobi]. http://erepository.uonbi.ac.ke/handle/11295/98571

Kilduff, M., Angelmar, R., & Mehra, A. (2000). Top management-team diversity and firm performance: Examining the role of cognitions. *Organization science*, *11*(1), 21-34.

Kim, L., & Lim, Y. (1988). Environment, generic strategies, and performance in a rapidly developing country: A taxonomic approach. *Academy of Management journal*, *31*(4), 802-827.

Kinyua, N. K. (2018). *Effect Of Government Policy And Macro Environment on Success of Rural Electrification in Kiambu County, Kenya* (Doctoral dissertation, University of Nairobi).

Kirui, D. K., & Moronge, M. (2016). Drivers of Performance of Devolved Health Projects in Kenya; A Case of Bomet County. *The Strategic Journal of Business & Change Management*, *3*(1), 36-78.

Kitonyi, S., Kibera, F., Gathungu, J., & Yabs, J. (2020). Effect of the Macro-Environment Factors on the Relationship between Firm Resources and Export Performance of Small and Medium Scale Manufacturing Enterprises in Nairobi City County, Kenya. *European Scientific Journal*, 16(28), 173-198.

Kundu, S., & Mondal, P. (2019). Luminance of contingency theory in revealing the leadership style of the academic librarians. *Library Philosophy and Practice*, 1-11.

Lindow, C. M. (2021). A strategic fit perspective on family firm performance. In *A Strategic Fit Perspective on Family Firm Performance* (pp. 49-93). Wiesbaden: Springer Gabler.

Linton, G. (2022). *Contingency theory in entrepreneurship research*. Masters Report, Örebro University.

Lu, J., Ren, L., Zhang, C., Liang, M., Abrhám, J., & Streimikis, J. (2020). Assessment of Corporate Social Responsibility performance and state

promotion policies: a case study of The Baltic States. *Journal of Business Economics and Management*, *21*(4), 1203-1224.

Mahmud, A. T., Ogunlana, S. O., & Hong, W. T. (2021). Key driving factors of cost overrun in highway infrastructure projects in Nigeria: a context-based perspective. *Journal of Engineering, Design and Technology*, 19(6), 1530-1555.

Maina, C., & Gathenya, J. (2022). Influence of economic factors on performance of project management among petroleum marketing firms in Kenya. *International Journal of Academic Research in Business and Social Sciences*, *4*(6), 146-152.

Makoveyenko, D., Siden, S., & Pyliavskyi, V. (2020). Generalized 5G mm Wave Propagation Model in an Urban Macro Environment. In *2020 IEEE International Conference on Problems of Infocommunications Science and Technology, PIC S and T 2020-Proceedings*, 2(3), 472-476.

Manowong, E., & Ogunlana, S. (2020). Strategies and tactics for managing construction stakeholders. *Construction stakeholder management*, 1(2), 121-137.

Masovic, A. (2018). Socio-cultural factors and their impact on the performance of multinational companies. *Ecoforum Journal*, *7*(1) 1-6.

McAdam, R., Miller, K., & McSorley, C. (2019). Towards a contingency theory perspective of quality management in enabling strategic alignment. *International Journal of Production Economics*, *207*, 195-209.

Memon, A. H., Rahman, I. A., & Azis, A. A. A. (2023). Time and cost performance in construction projects in southern and central regions of Peninsular Malaysia. *International Journal of advances in applied sciences*, *1*(1), 45-52.

Mobegi, J. O. E., James, R., & Sang, P. (2020). Social cultural attributes and Performance of Donor Funded Health Projects in Kenya. *European Scientific Journal*, 16(19), 558-578.

Mobegi, J. O. E., Sang, P., & James, R. (2019). Economic Environment and Performance of Donor Funded Health Projects in Kenya. *Journal of Economics and Business*, *2*(4), 1118-1128.

Mohajan, H. K. (2018). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, *7*(1), 23-48.

Moses, K. B. (2019). *Micro and Macro Environments and Implementation of Public Private Partnership Infrastructure Development in Kenya* [Doctoral dissertation, University of Embu]. http://41.89.240.73/handle/embuni/2204

Mujabi, S., Otengei, S. O., Kasekende, F., & Ntayi, J. M. (2020). Determinants of successful implementation of donor-funded projects in Uganda. *International Journal of Social Economics*, 42(12), 1139-1154.

Muriithi, W. Z., & Kiiru, D. (2021). Learning organization and performance of Kenya Urban Roads Authority. *International Academic Journal of Human Resource and Business Administration*, *3*(10), 29-45.

Musyoka, M. C., Gakuu, C., & Kyalo, D. N. (2017). Influence of Technological Environment on Performance of Gated Community Housing Projects in Nairobi County, Kenya. *European Scientific Journal, ESJ*, 13(3), 11-43.

Mwangi, D. N. (2020). *The Critical Role of Participatory Approaches on Performance of Major Infrastructure Projects: A Case of Selected Government (World Bank Funded) Projects in Nairobi, Kenya* [Doctoral dissertation, United States International University-Africa]. https://erepo.usiu.ac.ke/handle/11732/6092

Neely Jr, B. H., Lovelace, J. B., Cowen, A. P., & Hiller, N. J. (2020). Metacritiques of upper echelons theory: Verdicts and recommendations for future research. *Journal of Management*, *46*(6), 1029-1062.

Nguyen, L. D., Ogunlana, S. O., & Lan, D. T. X. (2018). A study on project success factors in large construction projects in Vietnam. *Engineering, Construction and Architectural Management*, 11(6), 404-413.

Njogu, E. M. (2016). *Influence of stakeholders' involvement on project performance: a case of NEMA automobile emission control project in Nairobi County, Kenya* [Doctoral dissertation, University of Nairobi]. http://erepository.uonbi.ac.ke/handle/11295/99866

Ochenge, M. D. (2018). *Project Management Practices and Performance of Road Infrastructure Projects Done by Local Firms in the Lake Basin Region, Kenya* (Doctoral dissertation, Doctoral dissertation, Kenyatta University).

Odhiambo, S. D. (2021). *Project Management and Implementation of Community-Based Projects in Siaya County, Kenya* [MBA Project, Kenyatta University]. https://ir-library.ku.ac.ke/handle/123456789/23658

Ogutu, B. O., & Muturi, W. (2017). Factors influencing successful completion of road construction projects in Kenya: The case of Kisumu County. *International Journal of Economics, Commerce and Management*, *5*(6), 657-698.

Olander, S., & Landin, A. (2018). A comparative study of factors affecting the external stakeholder management process. *Construction Management and Economics*, 26(6), 553-561.

Olawale, Y. A., & Sun, M. (2018). Cost and time control of construction projects: inhibiting factors and mitigating measures in practice. *Construction management and economics*, *28*(5), 509-526.

Omondi, K., & Kinoti, K. (2020). Stakeholder participation and performance of road construction projects in Kilifi County, Kenya. *International Academic Journal of Information Sciences and Project Management*, *3*(6), 274-292.

Onoriode, O. H., & Agbele, G. (2021). Fundamentals of Book Keeping Among Small-Sized Enterprises in South-South Nigeria. *Journal of Emerging Trends in Management Sciences and Entrepreneurship*, *3*(1), 44-50.

Opawole, A., Jagboro, G. O., Kajimo-Shakantu, K., & Olojede, B. O. (2019). Critical performance factors of public sector organizations in concession-based public-private partnership projects. *Property Management*, 37(1), 17-37.

Otieno, S. O. &Waiganjo, E. (2020). Factors Affecting Performance of Donor Funded Nutrition Projects: A Case Study of Mercy USA Nutrition Project, Kenya. *International Journal of Economics, Finance and Management Sciences*, 3(2), 546-555.

Owuze, C. A. (2018). Original Paper an Analysis of the Socio-Cultural Environment and Performance Influences on Manufacturing Enterprises in Nigeria. *Research in Economics and Management*, 3(4), 322-343.

Plomp, T. (2018). Educational design research: An introduction. *Educational design research*, 4(2), 11-50.

Project Management Institute (PMI). (2021). A *Guide to the Project Management Body of Knowledge (PMBOK, Guide)*, Fifth Edition. Newtown Square: Project Management Institute.

Roth, S. (2019). The open theory and its enemy: Implicit moralization as epistemological obstacle for general systems theory. *Systems Research and Behavioral Science*, *36*(3), 281-288.

Rugenyi, F. (2016). Assessment of the influence of project management competence on the triple constraint in projects in Nairobi. *International Journal of Academic Research in Business and Social Sciences*, *6*(4), 295-309.

Rumelt, R. P. (1979). Evaluation of strategy: Theory and models. *Strategic management: A new view of business policy and planning*, 5(2), 196-212.

Sabahi, S., & Parast, M. M. (2020). The impact of entrepreneurship orientation on project performance: A machine learning approach. *International Journal of Production Economics*, *226*, 107-121.

Safari, A., & Saleh, A. S. (2020). Key determinants of SMEs' export performance: a resource-based view and contingency theory approach using potential mediators. *Journal of Business & Industrial Marketing*, *35*(4), 635-654.

San Santoso, D., & Gallage, P. G. M. P. (2019). Critical factors affecting the performance of large construction projects in developing countries: A case study of Sri Lanka. *Journal of Engineering, Design and Technology*, 18(3), 531-556.

Sang, P.K. (2020). *Sustainability of World Bank Funded Projects in Kenya* [Unpublished PHD Thesis, Kenyatta University]. http://ir-library.ku.ac.ke/bitstream/handle/123456789/14237/Sustainability%20of%20world%20bank%20funded%20projects%20in%20Kenya....pdf?sequence=1

Scott, P. (2019). General system theory and the use of process mining to improve care pathways. *Applied Interdisciplinary Theory in Health Informatics: A Knowledge Base for Practitioners*, *263*(11).

Sirisomboonsuk, P., Gu, V. C., Cao, R. Q., & Burns, J. R. (2018). Relationships between project governance and information technology governance and their impact on project performance. *International journal of project management*, *36*(2), 287-300.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104(3), 333-339.

Solís-Carcaño, R. G., Corona-Suárez, G. A., & García-Ibarra, A. J. (2020). The use of project time management processes and the schedule performance of construction projects in Mexico. *Journal of Construction Engineering*, 9(3), 329-24.

Stojcetovic, B., Lazarevic, D., Prlincevic, B., Stajcic, D., & Miletic, S. (2022). *Project management: cost, time and quality*. In 8th International Quality Conference at Centre for Quality, University of Kragujevac.

Tang, Q., Zhang, X., Yang, X., & Francis, J. A. (2021). Cold winter extremes in northern continents linked to Arctic Sea ice loss. *Environmental research letters*, *8*(1), 014-036.

Thiong'o, S. M. (2021). *Market Entry Strategies, Marketing Channel Dynamics, Psychic Distance and Performance of Multinational Corporations in Kenya* [Doctoral dissertation, University of Nairobi]. http://erepository.uonbi.ac.ke/handle/11295/155784

Van Assche, K., Verschraegen, G., Valentinov, V., & Gruezmacher, M. (2019). The social, the ecological, and the adaptive. Von Bertalanffy's general systems theory and the adaptive governance of social- ecological systems. *Systems Research and Behavioral Science, 36*(3), 308-321.

Wambui, G. A., & Kisimbii, J. M. (2020). Social-Cultural Determinants Influencing the Performance of Community Based Projects in Kenya: A Case of Kilifi County. *Journal of Entrepreneurship & Project management*, *4*(5), 17-34.

Wernerfelt, B. (1984). A resource- based view of the firm. *Strategic management journal*, *5*(2), 171-180.

Yang, R. J., Wang, Y., & Jin, X. H. (2022). Stakeholder management in construction: An empirical study to address research gaps in previous studies. *International Journal of Project Management*, 32(7), 1213-1227.

Zhanglan, Y., Awino, Z. B., & Ogolla, K. (2019). Top management team, macro environment, managerial discretion and competitive advantage. *International Academic Journal of Human Resource and Business Administration*, *3*(6), 282-298.

Zorić, T., Makitan, V., Brtka, E., & Mrđen, S. (2021). Modern technologies influence on project success factors in IT sector of Serbia. *Journal of Engineering Management and Competitiveness (JEMC)*, *11*(2), 124-137.

Ørngreen, R. & Levinsen, K. (2017). Workshops as a Research Methodology. *Electronic Journal of E-learning*, 15(1), 70-81.

APPENDICES

Appendix I: Data Collection Instrument

Introduction

The purpose of this questionnaire is to collect data relating to the relationship between **Macro environment and Performance of Roads Construction Projects in Nairobi City County, Kenya**. You are hereby requested to complete this questionnaire. Note that any information given with respect to this request shall be treated with strict confidentiality and will only be used for the purpose of this research only.

SECTION A: BIODATA

What is your current highest level of educational attainment?

Certificate [ ] Diploma [ ] Undergraduate [ ]

Masters [ ] Doctorate [ ]

How long have you worked with roads construction projects in Nairobi City County?

Less than 5 years [ ] Between 5 and 10 years [ ] Between 10 and 15 years [ ]

Between 15 and 20 years [ ] More than 20 years [ ]

SECTION B: Macro environment and Performance of Roads construction projects in Nairobi City County

Social-cultural factors and Project Performance

1) The statements here relate to social-cultural factors in your organization. Please indicate the extent to which you agree or disagree with each assertions by circling one number on each line.

Key: Strongly disagree (1); Disagree (2); Not sure (3); Agree (4); Strongly agree (5)

	Assertions	1	2	3	4	5
1	Local land customs have acted as an impediment against road construction projects					
2	Community engagement helps in mitigating adverse attitudes towards road construction projects					
3	Failure to adhere to community norms can result in					

	conflicts and opposition.					
4	The literacy levels of the local community have a direct impact on the outcomes of road construction projects in Nairobi City County.					
5	The local community's awareness of road construction safety measures is adequate					
6	The efficiency of road construction projects in Nairobi City County is influenced by indigenous culture patterns, like as work schedules and cultural behaviors.					

Economic Factors and Project Performance

2) The statements here relate to economic factors in your organization. Please indicate the extent to which you agree or disagree with each assertions by circling one number on each line.

Key: Strongly disagree (1); Disagree (2); Not sure (3); Agree (4); Strongly agree (5)

	Assertions	1	2	3	4	5
1	Adequate access to financing and credit facilities can help mitigate delays in road construction projects in Nairobi City County					
2	Cost of labor for roads construction projects sometimes exceeds the budgeted plan					
3	Fluctuations in the price of construction materials make it challenging to adhere to project budgets in Nairobi City County					
4	The foreign exchange rate has a significant impact on the financial feasibility of road construction projects in Nairobi City County.					
5	Fluctuations in inflation rates make it challenging to accurately estimate project budgets and timelines.					
6	Effective interest rate management practices are employed to minimize project financing risks					

Technological factors and Project Performance

3) The statements here relate to technological factors in your organization. Please indicate the extent to which you agree or disagree with each assertions by circling one number on each line.

Key: Strongly disagree (1); Disagree (2); Not sure (3); Agree (4); Strongly agree (5)

	Assertions	1	2	3	4	5
1	Advanced construction technology is readily available in the market that helps improve the performance of our road construction projects					
2	There is a clear advantage in terms of project efficiency and quality when advanced construction methods and materials are employed in road construction projects.					
3	Digitization/automation of processes has enabled contractors to solve and foresee complex technicalities when even before construction begins					
4	Investments in research and development are actively pursued to improve road construction processes in Nairobi City County					
5	The availability of technology incentives motivates contractors to incorporate advanced technology in their construction processes					
6	We effectively utilize available technological infrastructure to enhance the efficiency of our road construction projects					

Political factors and Project Performance

4) The statements here relate to political factors in your organization. Please indicate the extent to which you agree or disagree with each assertions by circling one number on each line.

Key: Strongly disagree (1); Disagree (2); Not sure (3); Agree (4); Strongly agree (5)

	Assertions	1	2	3	4	5

1	Local political leaders collaborate with their colleagues in the national government to secure assurances for the implementation of road construction initiatives in Nairobi City County.					
2	The hierarchical bureaucracy within government agencies often leads to delays and inefficiencies in road construction projects					
3	The government funding is adequate for the completion of the road construction in time					
4	Political instability in Nairobi City County is a significant barrier to the successful execution of road construction projects					
5	Fraudulent and corrupt practices by government officials significantly hinder the timely execution of road construction projects in Nairobi City County.					
6	Political interference acts as stumbling blocks against construction of roads construction projects in Nairobi City County					

Government Policies and Project Performance

5) The statements here relate to government policies in your organization. Please indicate the extent to which you agree or disagree with each assertions by circling one number on each line.

Key: Strongly disagree (1); Disagree (2); Not sure (3); Agree (4); Strongly agree (5)

	Assertions	1	2	3	4	5
1	Government budget allocations for infrastructure projects are clearly communicated and transparent.					
2	Government rules and regulations are clear and easily understandable in the context of road construction projects in Nairobi City County					

3	The procurement and bidding processes in Nairobi City County are transparent and free from corruption					
4	Tax policies in Nairobi City County are conducive to private sector investment in road construction projects					
5	The trade policy frameworks have lacked coordination, leading to the existence of diverse policy regimes with varying standards and compliance mechanisms.					
6	Environmental Policy interventions are there in road infrastructure development to ensure that there is quality, reliability and attractiveness of road transport services					

Stakeholders' involvement and Project Performance

6) The statements here relate to project stakeholders' involvement in your organization. Please indicate the extent to which you agree or disagree with each assertions by circling one number on each line.

Key: Strongly disagree (1); Disagree (2); Not sure (3); Agree (4); Strongly agree (5)

	Assertions	1	2	3	4	5
1	Stakeholders actively participate in the identification of road construction needs in Nairobi City County					
2	Stakeholders play a significant role in planning road construction projects in Nairobi City County					
3	The involvement of stakeholders in the analysis of project requirements leads to better decision-making for road construction projects in Nairobi City County					
4	The project management team effectively monitors and controls stakeholder activities throughout the road construction project.					
5	Disputes and conflicts among project stakeholders are efficiently resolved to minimize disruptions to the road construction project.					

6	Information flows smoothly between stakeholders and there is efficient coordination among all parties involved in the road construction projects.					

SECTION C: Performance of roads construction projects in Nairobi City County, Kenya

7) The statements here relate to performance of roads construction projects in Nairobi City County. Please indicate the extent to which you agree or disagree with each assertions by circling one number on each line.

Key: Strongly disagree (1); Disagree (2); Not sure (3); Agree (4); Strongly agree (5)

	Assertions	1	2	3	4	5
1	The road projects in Nairobi City County are completed within the stipulated time frame					
2	Road's construction projects in Nairobi City County experienced cost overrun					
3	The quality of work on the road construction project in Nairobi City County met or exceeded expectations.					
4	Stakeholders (e.g., residents, authorities) expressed satisfaction with the road construction project's progress and outcome					

Thank you

Appendix II: List of KERRA Road Projects in Nairobi City County, Kenya

1. Ngong Road Phase II (Dagoretti corner -Karen junction section)
2. Western Bypass
3. Syokimau – Katani Road Phase II
4. Upgrading of Eastlands Roads Nairobi
5. Construction of Missing Link Roads and Non-Motorised Transport (NMT) Facilities
6. Outering Road Improvement Project Nairobi
7. Upper Hill Roads, Phase I
8. Dualling of Ngong Road Phase I (KNLS Nairobi-Dagoretti Corner)
9. Waiyaki Way - Redhill Link Road
10. Ngong Road - Kibera - Kungu Karumba - Langata Road
11. Nairobi Expressway project
12. Hunters - Githurai Missing Link
13. Access to Embakasi (Infinity) Industrial Park
14. Access to Embakasi (Infinity) Industrial Park (Phase II)
15. Ngong Road Phase II (KNLS Nairobi-Dagoretti Corner)
16. Eastlands Roads (Phase II)
17. Mathare Roads Nairobi
18. Lucky Summer - Gitwamba - Kasarani Mwiki Road
19. Industrial Area Roads Phase I
20. Access Road to Ruai Police Station
21. Upper Hill - Mbagathi Link Road, Nairobi
22. Upper Hill Roads Phase II
23. Flyover across the Northern Bypass and Approaches at Kahawa West
24. Eastleigh roads Phase II
25. Nairobi Eastern Bypass (From Baraka Roundabout to Ruiru/Kamiti Junction)
26. Eastleigh Estate Access Roads
27. Lenana - Muchugia – Dagoretti Market Link Road
28. Ngong Road (Dagoretti Corner - Karen Roundabout Section)
29. Kangundo Road - Greater Eastern Bypass Link Road
30. Syokimau - Katani Phase II Machakos
31. Rhino Park & other access roads.

32. East Africa Portland Housing Scheme
33. Mombasa Road(Devki)- Kinanie Park/Kinanie Leather Park
34. Mwanyani Katoloni Road
35. Mlolongo - Kware - Katani Link Road (Phase I)
36. Mlolongo - Athi River Joska Road
37. Innercore Estate Roads
38. Githurai – Kimbo Road (Phase II)
39. Kenyatta University Footbridge over Railway Line
40. Kahawa Sukari Estate Access Roads
41. Thika Bypass – Kiambu
42. Ruaka - Banana - Limuru & Thogoto – Gikambura - Mutarakwa (Phase III)
43. Muigai Inn-Ichaweri -Gatundu -Kangoo/ Kibichoi-Ichaweri-Mataara (Mau RD)/A3
44. Broadway -Kiandutu –Athena- Engen-Kiganjo - Muthaiga
45. Gatukuyu – Matara
46. Muiigai Inn Brister Girls Star of Hope Loop
47. Improvement of Nairobi Roads Lot 2 (Part of Likoni Road, Enterprise Road and Shreeji Road)
48. Thika Town roads
49. Gatundu-Karinga-Flyover
50. Indian Bazaar - Ndumberi - Ting'ang'a – Riabai
51. Githurai -Kimbo Phase II
52. Flyover Bridge Across the Northern Bypass And Approaches at Kahawa
53. Thika - Kithimani - Mwingi - Ukasi (A3) Road
54. Nairobi Access to Prime Rose Section
55. Nairobi Jaharis- Kayole River Section
56. Nairobi Ngina Close
57. Nairobi Primrose -Winners Church Road
58. Nairobi Dandora Phase 3 - Samkon-Kk Road
59. Nairobi Pewa Street Road Section
60. Nairobi Kiambiu Access Road
61. Nairobi Midax - Chokaa Estate Road
62. Nairobi Jamhuri Court C Road

63. Nairobi Ukwala Lane Road
64. Nairobi Bujumbura Road Section
65. Nairobi Onyonka Estate Road Section
66. Nairobi Daniel Comboni Road
67. White Castle-Maumau Road-Mathare River
68. Kamwangi-Kangoo Road
69. Karangi jn c556-Githunguri Tea Buying Centre-Karinga Primary 4 School
70. Ruburi-Gaitegi
71. Ikinu-Karia-Rioki
72. Juja Zone Tea-Ndururumo Primary-Ndarasha Road
73. Kingeero-Kamutiini Road
74. Kimacia-Gataara Road
75. Kanunga-Banana
76. Karura-Kagongo
77. Kanunga-Kaburi Road
78. Thindigua Access Roads
79. Mbauini-Karii-Gwa Kioi Road
80. Riverside-Crescent Road
81. Kidfarmaco Lane Roads
82. Pcea gatune-Kwa Njonge Mathini
83. Wambaa Primary Muslim Road
84. Gathwariga-Wahika Road
85. Karinga-Gathwariga
86. Kimende-Bathi road
87. Rironi-Nyoro Primary School
88. Kadumo-Bethel Road
89. Lmr Kiawaroga Primary School-Biashara Jct- Kiramba-Ini Chief Office
90. Super Duka Access Roads
91. Githima Primary Komo
92. Immaculate Hospital- Ha Paul-Kasieki Road
93. Thika Aipcea Ngoigwa-Jescad-Kahara-Mischeck-Jct b
94. Show Ground - Oloosuyian
95. Bissil - Esiati

96. Councillor Malit - Kentraco
97. Elangau - Sholinke
98. Metro - Arroi
99. Rimpa - Kahuho
100. Jua Cali - St. Joseph Primary School
101. Kianugu - Oloolua
102. Pcea mericho - Mericho Road
103. Mt. Carmel - Mericho Forest
104. Leinkati Primary School - Oltiasika
105. Mbirikani - Loua(Section B)
106. Kipeto - Oloyangalani
107. Najile - Ewaso Kedong
108. P/site - Njoronyori - Kwa-Nchipaai - Olmaiyana
109. Kakuyuni - Kithuthi -Kathome Iiaituni
110. Kanyangii - Aic Manyatta
111. Kikambuani - Kamutonga -Kinyambu
112. Katwii - Miu - Kaseve
113. Leleni(Mitimuonza) - Ngoleni
114. Katitu - Nzaikoni
115. Nzaikoni - Kaviani - Kiene Sub Location Hq
116. Mutuyu -Wathia -Kathiani
117. Kenol - Muanga - Masokani
118. Cb kajiado Konza - Kimutwa
119. Kamuthini - Mbukuni - Kitonyini
120. Machakoskimutwa - Kaathi - Makakoi
121. Machakoskwa mukeka - Kasinga Pri. -Ngengeta
122. Machakos Lysak - Manza Pri. - Sweetwaters
123. Machakokswa Mwau - Mikuyu - Centre Of Exc Katelembo
124. Masinga - Kitangini
125. Kaewa -Iiani - Nyangeni
126. Iiani - Kyondoni
127. Thatha - Kiseuni
128. Kinyui - Miseleni

129. Tala - Kinyui
130. Kituluni - Kitambasye
131. Nguluni -Kathaani
132. mavoko Muthwani - Mua
133. Muthwani Jnct. -Kalusya Pri -Nzoiani
134. Mavoko Lower Kalimani - Kiasa
135. Mavoko Ndovoini - Ivovoani
136. Mavoko Seme - Mwangaza
137. Mavoko - muthwani
138. Miseleni - Kindaruma
139. Kivandini - Miseleni
140. Mbiuni - Miseleni
141. Ndulumoni - Kalala -Kayaata
142. Utithini - Kikelenzu - Muumoni
143. Masii - Yoani
144. Matuu - Kitheuni
145. Kisiiki - Sofia
146. Vota - Mamba
147. Kambi ya Ndege - Jnct Kimangu
148. Kyua - Seku
149. Kamurugu - Jct. A2 Mackenzie
150. Db Mathioya - Jct. C544 St. Marys
151. Mairi - Jct. B25 Kaharati
152. Jamhuri Estate Impala Court Access Phase I
153. Nairobi Five Star Estate Road
154. Nairobi Onyonka Estate Road Section
155. Tassia Stage-Tassia Church - Kwa Ngege Road
156. Nairobi Sinking Road
157. Ngemwa-Ikinu
158. Baraka ii-Mugutha Police Post
159. St Luke Ndambo Ndongoro Road
160. Damacrest- Ha Chege-Riu Nderi Road
161. Kanyanjara Primary-Kanyanjara Shopping Road

162. Valley Land-Viwandani-Mukuvu Estate Roads
163. Mwihoko Primary-Stage 46- Stage
164. Thk jct C54 Athena Poly-Kimuchu
165. Eseki - Imarba
166. Mashuru-Arroi
167. Olepolos - Olooloua Dispensary
168. Njarai - Olorika
169. Kimuka - Kisamise
170. Makaveti - Iiuni
171. Yaitha - Kanyongo
172. Muthwani - Katuneni
173. Kyaani - Katulani
174. Kariua - Db Maragua
175. Gitugi - Nyangiti
176. Kiriaini - Kangongi

Source: Kenya Roads Board (KRB) Annual Reports

Appendix III: Graduate School Letter of Authority

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

OUR REF: D86/CTY/28446/2019

Date: 1st August, 2023

The Director General,
National Commission for Science, Technology & Innovation,
P.O. Box 30623-00100,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR AKUTO M. KAMARKOR REG.NO. D86/CTY/28446/2019

I write to introduce Akuto who is a Postgraduate Student of this University. The student is registered for Ph.D. Degree programme in the **Department of Management Science in the School of Business, Economics & Tourism.**

Akuto intends to conduct research for Ph.D. Thesis entitled **"Macro Environment and Performance of Roads Construction Projects in Nairobi City County, Kenya"**

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
EXECUTIVE DEAN, GRADUATE SCHOOL

JMO/cao

Appendix IV: Approval of Research Proposal

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 57530

Internal Memo

FROM: Dean, Graduate School

DATE: 1st August, 2023

TO: Mr. Akuto M. Kamarkor
C/o Department of Management Science
Kenyatta University

REF: D86/CTY/28446/2019

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

We acknowledge the receipt of your revised Research Proposal entitled "Macro Environment and Performance of Roads Construction Projects in Nairobi City County, Kenya" as per recommendations raised by the Graduate School Board 12th July, 2023.

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed supervision Tracking and Progress Report Forms. The Forms are available at the University's Website under Graduate School webpage downloads.

Also, please ensure that you publish article(s) from your thesis before submitting it to Graduate School for examination as per the Commission for University Education and Kenyatta University guidelines. By copy of this letter, the Registrar (Academic) is hereby requested to grant you substantive registration for your Ph.D. studies.

Thank you.

JOHN M. OLONGI
FOR EXECUTIVE DEAN, GRADUATE SCHOOL

c.c. Registrar (Academic) Att. Mr. Richard Chweya
Chairman, Department Management Science

Supervisor

1. Dr. Paul Sang
   C/o Dept. of Management Science
   Kenyatta University
2. Dr. David Nzuki
   C/o Dept. of Management Science
   Kenyatta University

JMO/cao

Committed to Creativity, Excellence & Self-Reliance

Appendix V: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **707924**

Date of Issue: **21/August/2023**

RESEARCH LICENSE

This is to Certify that Mr.. MUSAEH KAMARKOR BP AKUTO of Kenyatta University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: MACRO ENVIRONMENT AND PERFORMANCE OF ROADS CONSTRUCTION PROJECTS IN NAIROBI CITY COUNTY, KENYA for the period ending : 21/August/2024.

License No: **NACOSTI/P/23/28602**

707924

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions