COST OF CONSTRUCTION AND PERFORMANCE OF HOUSING PROJECTS IN NAIROBI COUNTY, KENYA: A CASE OF PANGANI HOUSING PROJECT

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A Research Project Submitted in Partial Fulfilment of the Requirements for the Award of the Degree of Master of Arts in Project Planning and Management of the University of Nairobi

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DECLARATION

This research work is entirely unique with no submissions made to other universities for consideration for a degree or other honours.

Signature : **Date** : **09/11/2023**

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L50/37090/2020

This research project has been submitted with my approval as the supervisor.

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DEDICATION

I dedicate this research project to my mother, Teresa Muthoni, my father, Nelson Ngari and my brother, Kenneth Njoma.

ACKNOWLEDGEMENT

First and foremost, I am grateful to God for his unending grace.

Secondly, I am thankful to my supervisor Charles Wafula Misiko (PhD) for according me guidance in this project.

Finally, I am appreciative of my family and friends for their support and prayers.

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ABBREVIATIONS AND ACRONYMS

AHP:	Affordable Housing Project
CAHF:	Center for Affordable Housing Finance
EIAs:	Environmental Impact Assessments
ICT:	Information Communication and Technology
KNBS:	Kenya National Bureau of Statistics
NGOs:	Non-Governmental Organizations
PMI:	Project Management Institute
WBS:	Work Breakdown Structure

ABSTRACT

According to CAHF (2022), the demand for housing in Kenya stands at 250,000 units whereas housing supply is 50,000 units annually. This translates to only 20% of housing demand being met. In this light, this research project probed the effect of cost of construction on performance of Pangani AHP. The study was guided by the Agency Cost and the Program theories. Project managers and contractors overseeing Pangani AHP, Nairobi County Ministry of Infrastructure, Ministry of Lands, Public Works, and State department of housing and urban development staff were among the target participants. The researcher used questionnaires as well as interview schedules in collection of data. For analysis of data, the researcher employed descriptive and inferential statistics. The independent variables for the study included cost of building materials, land, financing and professional services. The findings indicated there is a substantial and positive correlation of 70.2% between building materials' costs and performance of housing projects. The study's findings also revealed there is a positive relationship of 60.5% between cost of land and performance of housing projects. In addition, the study demonstrated there is a strong positive relationship of 73.3% between cost of financing and performance of housing projects. Further, the study showed there is a substantial positive correlation of 58.4% between performance of housing projects and professional services' costs. The research concluded that there is a positive significant effect of cost of construction on performance of housing projects. The study recommends use of strategic procurement methods such as bulk purchases as well as land acquisition planning. The study further recommends employment of cheaper and flexible loan terms in addition to negotiating favorable professional fees with service providers.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Housing is a critical physiological and social necessity for human life (McLeod, 2018; Doyon and Moore, 2020). Inadequate housing has been connected to the high cost of building materials, labor, land, professional fees and other incidental expenditures involved during house construction. KNBS (2023) reported a decrease in housing unit construction, which was ascribed to increased construction material and finance prices. In the second quarter of 2023, compared to the first quarter, the average selling price of land in the Nairobi region grew by 1.6%, according to Hass Consult (2023). Additionally, Hass Consult (2023) revealed that, compared to a 6.6% gain in 2022, the average selling prices of residential homes increased by 2.0%. As per CAHF (2022), the yearly housing demand is 250,000 units, while the supply is 50,000 units. This means that just 20% of the housing need is being fulfilled. The Pangani Housing Project, which was introduced in June 2020, is one of the affordable housing initiatives that Kenya's government developed to solve the country's housing need.

The Agency Cost and the Program theories were the two theoretical pillars that guided the investigation. Mitnick and Ross (1970) introduced the Agency Cost Theory, which is based on financial management theory and tackles stakeholder conflicts of interest, namely the mismatch between objectives and fund management principles. In this study, this theory is highly relevant, providing a lens to analyze potential conflicts and agency costs that may arise among different entities involved, such as contractors, government authorities, and private investors. However, the Programme Theory—which Suchman developed in the 1910s—is frequently used in the project planning stage and offers a thorough explanation of the logic model. Understanding cause-and-effect interactions in the context of construction costs and their effects on the performance of affordable housing projects in Pangani is made possible by this theory.

Globally, the construction sector plays a vital role in economies, serving as a key driver of employment and growth. Despite its importance, construction projects face challenges such as delays and cost overruns due to resource mismanagement (Ronald & Agung, 2018). Scholars globally explore factors for sustainable housing projects amid increasing demand fueled by urbanization and population growth (Kim, 2019). However, rapid urbanization brings challenges like unemployment and housing shortages (Mahamid, 2021; Necesito, 2018). Governments, including Kenya, address housing deficits through initiatives like the Affordable Housing Programme (AHP) under the Big 4 Agenda, aiming to bridge the gap between supply and demand, especially for low-income households (CAHF, 2021). Despite efforts, informal settlements persist due to affordability issues in the formal market. Over the past 30 years, existing housing policies in Kenya proved inadequate, leading to the launch of the AHP in 2017, addressing housing affordability across socio- economic strata (Kieti, Rukwaro, and Olima, 2020).

1.1.1 Cost of Construction

As stated by Assaf and Al-Hejji (2018), construction cost entails the development and management of a project's budget, encompassing financial resources to anticipate upcoming expenses and mitigate the risk of exceeding the budget and experiencing cost and time overruns. According to the findings of Sambasivan and Soon (2018), the cost of construction represents the overall expenditure associated with erecting a structure, infrastructure, or any development project. This includes a diverse range of costs related to planning, design, materials, labor, equipment, and permits. Additionally, a study conducted by Ondari and Gekara (2020) emphasizes the significant role of regulatory policies in influencing the cost of construction and project implementation. The study suggests that regulatory policies can be assessed through factors such as legal costs in construction, administrative expenses, and costs related to environmental protection and mitigation. This research defines construction cost as the aggregate expenses associated with land, financing, professional services, and building materials, all of which impact the efficacy of housing construction.

According to Sambasivan and Soon (2018), exploring influence of construction costs on performance of projects warrants a comprehensive investigation into various research issues. These include assessing the affordability and accessibility of housing units in relation to

Construction costs, examining the influence of cost variations on the quality, durability, and timely completion of affordable housing, and analyzing the financial viability of projects and their sustainability. Investigating stakeholder satisfaction, encompassing residents, investors, and government agencies, is crucial, as is exploring how innovations in construction technologies can mitigate or exacerbate cost impacts. The role of regulatory policies in shaping construction costs and their effectiveness in balancing affordability and quality should also be scrutinized. Moreover, understanding the broader community impact, conducting risk management analyses, and undertaking a comparative assessment of different projects with varying construction costs are vital aspects to consider in this research endeavor.

According to Li and Chen (2018), detailed understanding of construction costs is required for successful project planning and financial management, emphasizing the importance of exact cost estimation and budget allocation in achieving project goals. Furthermore, Wang et al. (2019) underline the need of investigating building costs for specific projects like Pangani in order to overcome the unique challenges posed by regional conditions, legislation, and market determinants. Gupta and Patel's (2020) research also looks at the impact of government subsidies in affordable housing projects, shedding light on how financial assistance might improve the profitability and overall success of housing projects.

1.1.2 Performance of Housing Projects

Several parameters are used to assess the performance of projects such as timely completion, budget adherence, and maintaining quality throughout the project's life, is essential. According to Othieno (2019), it's critical to assess residential housing projects according to cost and quality control. Kim (2019), however, argues that poor quality, delivery delays, and budget overruns plague a lot of government housing initiatives worldwide. These worries are often linked to growing living expenses, which raise the price of building and materials. Mahamid (2021) reports that 88% of residential construction projects encounter delays and that 76% of them suffer cost overruns. As per Hazhar's (2020) findings, the processes of monitoring and assessment prove to be valuable strategies in enhancing the implementation of projects concerning time, cost, and quality. This research specifically defines housing performance by emphasizing the timely conclusion of construction, adherence to budgetary constraints, compliance with the project scope, and the delivery of high-quality houses.

The Kenyan state plans to construct 1.3M houses over the next five years in response to rising housing demand, particularly in urban areas like Nairobi, according to data released by the Economic and Social Rights Centre (2018). Two hundred and twenty thousand of these units are designated as social housing and the remainder eight hundred thousand as conventional housing. A realistic objective, according to government authorities, is 530,000 dwellings, including 100,000 units of social housing to be built during the next five years. The National Social Security Fund (NSSF) will provide 30%, the government will contribute 10%, and private sources will provide the remaining 60% of the funding for these projects. Nairobi, Machakos, Eldoret, Mombasa, and Nakuru are the five major cities where 7,500 acres of land will be covered by these proposals.

The progress of housing initiatives is hampered by a number of factors, both nationally and internationally. Ronoh (2020) estimates that cost overruns happen in about 80% of residential housing projects, with severe cases seeing up to 173% of them. Furthermore, 46% of Nairobi County's building initiatives are completed, with 12% coming to a complete halt, according to Kihoro (2017). The ongoing lack of homes in Nairobi City County is made worse by these projects' delays, delivery schedules, and growing development expenses. Furthermore, Kaniaru (2018) emphasizes that the collapse of these housing projects might result in a reduction in the supply of high-quality dwellings and have a detrimental effect on the economy. Elizabeth (2020) also notes that while monitoring and assessment are a common feature of government housing programs, stakeholder participation is low and communication is poor.

1.1.3 Cost of construction and performance of housing projects

Ronoh (2020) focused on completion time, cost, and satisfaction in his research analysis of the execution of housing construction projects. Ndungu (2017) conducted an evaluation of the Kenya Police Service's government housing projects in Nairobi. The study assessed many criteria, including budget adherence, stakeholder satisfaction, timeliness, and achievement of objectives. Both studies found that rising building material and other technical costs result in the development of poor housing complexes. These studies' suggestions emphasized the significance of rigorous planning and budgeting to secureadequate money for the realization of high-quality projects.

According to a detailed analysis by Li and Wang (2017), the cost of construction emerges as a factor with considerable consequences for project outcomes, underscoring the critical

importance of good cost management in guaranteeing the financial feasibility and success of housing projects. Furthermore, Chen et al.'s (2018) study delves into the details of the relationship, emphasizing how cost fluctuations, material selections, and construction timetables impact the overall effectiveness and quality of housing projects. Furthermore, Gupta and Patel (2019) analyse how government help influences construction costs and, as a result, project results, revealing how financial aid may increase economic viability and overall project success.

The cost of construction stands out as a factor with broad implications for project success, as shown by Smith and Johnson's research (2019), underscoring the significance of precise cost estimation, budget management, and resource allocation in housing projects. Additionally, Chen et al. (2020)'s research goes into the many facets of this connection, highlighting the impact of project timeframes, labour costs, and building materials on the general effectiveness and quality of housing projects (Chen et al., 2020). The study by Gupta and Miller (2021) also investigates how regulatory expenses affect construction costs, illuminating how compliance with rules affects project budgets and, ultimately, performance of housing projects.

1.1.4 Pangani Housing Project

The Pangani Affordable Housing Project is a transformative initiative aimed at addressing the pressing need for affordable housing in Nairobi County. Spearheaded by a collaboration of government agencies, private developers and community stakeholders, the project aims to provide sustainable and cost-effective housing solutions for a diverse range of residents. The key objectives of the Pangani Affordable Housing Project include creating a mix of housing options accessible to low to middle-income families as well as fostering a sense of community.

The project involves the construction of well-designed, energy-efficient housing units that adhere to high-quality standards. Emphasizing environmentally friendly practices, the Pangani Affordable Housing Project incorporates green spaces, energy-efficient technologies, and sustainable construction materials. Community engagement is integral to the project, with input from residents considered in the planning and design phases to meet their specific needs. Affordability is a central focus, with innovative financing models and partnerships driving down costs for prospective homeowners. The Pangani Affordable Housing Project also prioritizes accessibility to essential services, transportation, and educational facilities, contributing to the overall well-being and convenience of residents.

1.2 Research Problem

A world where just a few people can afford good homes is unsustainable. The right to adequate housing is one of several socioeconomic objectives that underpin sustainable development. Affordable housing entails more than simply a dwelling, it also includes access to amenities. Inadequate affordable housing is one of the greatest problems facing developing countries in Africa. Unfortunately, with rising living costs and growing unemployment, the availability of affordable housing will remain a social policy issue for a long time (Arimoro, 2020).

In Kenya, housing demand outstrips supply by far which has resulted in expansion of informal settlements such as Kibra and Mathare slums. According to Matindi (2018) figures, housing shortages are more acute among urban low- and middle-income families, with an estimated 6,000 dwellings, or 20% of all homes constructed for this category, being built. The absence of effective housing sector policies in Kenya has impeded low-income house building. Home financing is an example of this, since major Kenyan financial institutions continue to disregard the supply of cheap home loans, leaving this to secondary financial institutions.

Affordable housing deficit has been associated with high cost of building materials, labour, land, professional fees, and other incidental expenses incurred during construction (KNBS, 2023). Construction cost in Kenya has escalated over the years and is relatively high compared to regional standards (CAHF, 2021).

While there is a large body of literature on various factors influencing accessibility to cheap housing in Kenya, little to no research has been conducted examining the extent to which cost of construction influences affordable housing projects in Kenyan cities such as Pangani. Wambugu (2018) evaluated how government policies and initiatives facilitate low-income earners' access to inexpensive housing. However, the study did not look at how building costs affected affordable housing projects' ability to stay within budget, finish on schedule, and maintain their quality over time. In a dissertation on cheap and sustainable housing in Nairobi. Eglin, T. (2023) looked at the opinions of significant players in the housing affordability space. Nevertheless, the research was qualitative in character and produced no clear conclusions. Given the aforementioned, it is clear that not much research has been done on the relationship between housing developments in Kenya and building costs. Therefore, the purpose of this study was to respond to the following query: what is the influence of cost of construction on performance of housing projects?

1.3 Research Objectives

This study was guided by the following objectives;

i. To examine the influence of cost of building materials on performance of housing projects in Nairobi County, Kenya.
ii. To examine the influence of cost of land on performance of housing projects in Nairobi County, Kenya.
iii. To examine the influence of cost of financing on performance of housing projects in Nairobi County, Kenya.
iv. To examine the influence of cost of professional services on performance of housing projects in Nairobi County, Kenya.

1.4 Value of the Study

The study can be used by government officials to shape housing policies. Understanding the influence of construction costs on housing projects performance can lead to more effective and targeted policies and regulations.

Insights from this study will help project managers in better planning, budgeting, and controlling costs in similar housing projects. They can learn from the challenges and successes of the Pangani housing project, potentially improving their decision-making process.

Scholars and researchers interested in Kenyan housing projects, urban development, and construction management would find this study to be a useful resource. It will add to the database of knowledge already in existence by offering practical insights that may be used to more research and discussion.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

An extensive examination of relevant literature was provided. This review encompassed a thorough analysis of both theoretical perspectives and empirical studies. Additionally, a conceptual framework is presented, serving as a structured foundation that integrates different variables.

2.2 Theoretical Framework

A theory is an explanation for a phenomenon that has been noticed over time (Wambugu L, 2015). This study was guided by the agency cost and program theories.

2.2.1 Agency Cost Theory

This theory was established by Mitnick and Ross (1970). It emphasizes the diversity of viewpoints among people whohave various interests in the same item. The idea addresses unique issues about the alignment of goals and money management principles in order to achieve harmony with one another.

Minocha (2005) reported that account administrators had considerable challenges when attempting to use finance theory. This was particularly evident when attempting to estimate stock returns during optimization procedures aimed at determining the effective limit, maximum risk, and return range. The incapacity to forecast stock risk and return characteristics was the primary cause of the problems. These problems arose from a number of discrepancies and significant flaws discovered by finance theorists using the fundamentals of existing portfolio theory (Minocha, 2005). According to him, investors should aim to minimize risk while maximizing rewards for a given level of risk.

Finance theory, according to Mitnick (2005), shows us how estimations for real shares are combined to create portfolio predictions, as well as what to expect in terms of future risk and return. However, the theory's detractors claim that because some data must be utilized, it only provides restricted estimates of return, variance, and covariance, which leads to estimation bias.

The Agency Cost Theory was highly relevant to the topic of the cost of construction and its impact on the performance of the Pangani affordable housing project. This theory, primarily associated with financial and management literature, focuses on the conflicts of interest that arise between different stakeholders within an organization, particularly between principals and agents as well as competing interests.

In this context, the theory could be applied to analyze potential conflicts of interest and agency costs that may arise between different entities involved in the project. In addition, the theory could be used to examine the competing interests in provision of high-income housing vis a vis provision of affordable housing targeting low- and middle-income earners. Most real estate developers are focused onconstructing housing projects targeting high end income earners despite the low-income households making up the majority of Kenya's population. Further, major Kenyan financial institutions are biased towards financing high income earners leaving the supply of cheap homeloans to secondary financial institutions.

2.2.2 Program Theory

The concept was first proposed by Suchman in the 1910s, and it is often promoted in the planning stages of new projects. The hypothesis may also emerge towards the end of the project or throughout its implementation. It is crucial to review the program theory and challenge the cause-and-effect relationship that gives rise to fundamental concerns while getting ready for an evaluation. Program theory has been used to suggest evaluations over the years; it shows how a program might address an issue during requirements analysis. Additionally, it provides techniques for evaluating project effect components (Sethi and Phillipines, 2012).

According to Rossi (2014), a program is an organization's idea of how to utilize resources and programming activities to ensure that the planned interventions are received by the intended beneficiaries. Similar to baseline research and logical models, a programming theory is an idea. The issue of constructing expenses and their impact on the success of the Pangani AHP might be addressed utilizing the program theory. This concept is frequently used in the project planning stage, but it can also emerge during the project's execution or conclusion. In the context of assessing the cost of construction, analyzing the program theory becomes crucial to understand the cause-and-effect relationships of cost of construction on the performance of the Pangani housing project.

2.3 Performance of Housing Projects

Teja (2020) states that construction enterprises operate on both public and private construction projects that call for skilled management and coordination in order to maximise resources, advance work continuously, generate revenue and profitability. The total effectiveness of housing projects is significantly impacted by effective cost control, financial feasibility assessments, and budgeting (Teja, 2020).

Divakar and Jebin (2018) investigated and discovered a number of important contributions to the variables negatively affecting construction project performance. These include a contract that imposes an unreasonably strict timeline, a poorly defined scope, high land costs, inaccurate direct and indirect cost estimates, inaccurate activity cost estimates, problems with the distribution of direct, indirect, and joint costs, infrequent project budget updates, a poorly defined Work Breakdown Structure (WBS), schedule modifications, lax regulation and control, frequent changes in subcontractors, a lack of experience and training for project managers, low labor productivity, and a failure to implement project management tools for monitoring and control.

Auma (2017) used a descriptive and quantitative study design to examine the variables impacting project success in Kenyan construction projects. The intended audience included Kenyan house building projects. Likert-type questionnaires were used in the study to gather data, which was then subjected to analysis. The study demonstrated how budgeting improves construction project performance. Eglin, T. (2023) published a dissertation on sustainable and affordable housing in Nairobi andexamined major actors' perspectives on housing affordability. The study highlighted that stakeholders' involvement and participation contribute immensely to project success and overall performance.

2.3.1 Cost of Building Materials and Performance of Housing Projects

Sanchezz and Hayas (2018) looked at the impact of material costs on project results and advocated for the adoption of ICT-based methods in material management for construction projects. The study explored current ICT techniques in use within construction projects. A crucial component of construction management, according to Hazhar (2020), is the interaction between the price of construction supplies and the success of the project. Materials costs account for a sizable amount of the project budget overall, which affects resource allocation

and financial sustainability. Fluctuations in material costs can impact project timelines, quality of construction, and the ability to adhere to budgetary constraints.

Effective management of material costs involves not only procurement at the bestpossible prices but also considerations of material availability, quality, and sustainability. Thechoice of building materials directly affects the structural integrity, durability, and overall performance of the constructed project. Balancing cost considerations with the need for high- quality materials is a delicate yet pivotal task for project managers. An in-depth analysis of this relationship provides valuable insights for project planning, risk mitigation, and decision-making processes, ultimately contributing to the successful delivery of housing projects.

According to studies by authors like Smith and Brown (2018), material prices have a major influence on project budgets (Smith & Brown, 2018). Further investigation into the complex link between material costs and project deadlines is done by Johnson et al. (2019), who also emphasize the possible dangers related to cost swings and material shortages. Moreover, the work of Garcia and Chen (2020) underscores the criticality of material quality in determining performance of constructed projects, adding another layer of complexity to the material selection process (Garcia & Chen, 2020). As demonstrated in these scholarly investigations, a thorough understanding of the interplay between material costs and performance of housing projects is essential for effective project management and risk mitigation.

2.3.2 Cost of Land and Performance of Housing Projects

Scholarly study emphasizes that a crucial component of real estate construction and development management is the impact of land cost on housing project performance. In their comprehensive study, Li and Li (2017) delve into the critical role of land costs in shaping project feasibility, emphasizing that the acquisition expenses of land can significantlyimpact the overall project budget and financial viability (Li & Li, 2017).

Furthermore, the work of Chen et al. (2018) highlights the intricate relationship between land costs and project timelines, indicating that high land costs may lead to prolonged negotiations and approval processes, potentially affecting project schedules (Chen et al., 2018). Additionally, the study by Wang and Smith (2019) underscores the importance of considering the spatial and locational attributes of land in relation to performance of housing projects, as accessibility, infrastructure, and zoning regulations can all influence the successful execution of construction projects (Wang & Smith, 2019). Through these scholarly investigations, it

becomes evident that a nuanced understanding of the influence of land costs is crucial for effective project planning, risk management, and the overall success of construction endeavors.

Researchers such as Kim and Park (2020) have extensively explored the impact of land costs on project risk, emphasizing that fluctuations in land prices can introduce uncertainties that significantly influence project outcomes (Kim & Park, 2020). Moreover, the work of Zheng and Ren (2021) underscores the importance of regulatory costs associated with land acquisition, suggesting that compliance with land use regulations and zoning requirements can contribute to additional expenses and potential delays in project execution (Zheng & Ren, 2021).Additionally, the study by Gupta et al. (2018) accentuates the regional disparities in land costsand their implications on performance of housing projects, highlighting the need for nuanced strategies that consider the local economic context (Gupta et al., 2018). These academic contributions demonstrate how crucial it is to have a thorough grasp of how land costs affect housing project performance in order to make well-informed decisions and ensure the long-term viability of housing developments.

2.3.3 Cost of Financing and Performance of Housing Projects

Scholarly research examined the impact of financing costs on housing project success, offering important insights into the intricacies of financial management in the building sector. Researchers such as Smith and Johnson (2019) have emphasized the critical role of interest rates in shaping the financial landscape of constructionprojects (Smith & Johnson, 2019). Further, the study by Chen et al. (2020) delves into the implications of different financing structures, indicating that the choice between debt and equity financing can have varying effects on housingconstruction projects (Chen et al., 2020).

Moreover, the work of Brown and Williams (2021) underscores the importance of considering macroeconomic factors in assessing feasibility of construction projects (Brown & Williams, 2021). Gupta & Belinda (2018) state that the project proprietor ought to determine the project's financing from the beginning and estimate the highest possible finance budget. Setting aside resources in the construction industry is crucial for meeting project goals of quality and timely completion. Li and Wang(2018) underscore that the composition of loan terms and conditions holds substantial influenceon project outcomes (Li & Wang, 2018). Gupta and Patel (2019) also investigated the effects of government incentives and subsidies on project financing and suggested that financial support from governmental bodies can greatly increase the

performance and economic viability of housing construction projects (Gupta & Patel, 2019). Furthermore, Zhang and colleagues (2020) examine the role that risk management tactics play in mitigating the effects of funding expenses, providing valuable perspectives on how effective risk reduction techniques might enhance project outcomes.

2.3.4 Cost of Professional Services and Performance of Housing Projects

According to Ling and Hoi (2018), delays in the issuance of pertinent permits—which typically precede time schedule delays—are mostly to blame for poor project execution in local government building projects. Because the ripple effect often drives up building prices. According to Smith and Johnson (2017), professional services play a crucial role in determining the financial landscape of housing projects, with permitting fees and compliance expenses contributing significantly to project budgets (Smith & Johnson, 2017).

Additionally, the work of Chen et al. (2019) emphasizes the impact of land use and zoning regulations on project timelines, suggesting that navigating these regulatory requirements incurs costs that can affect the overall performance of housing construction projects (Chen et al., 2019). Furthermore, the study by Gupta and Miller (2020) delves into the implications of legal and consulting fees associated with regulatory compliance, highlighting how these costs can influence the financial sustainability of housing projects (Gupta & Miller, 2020).

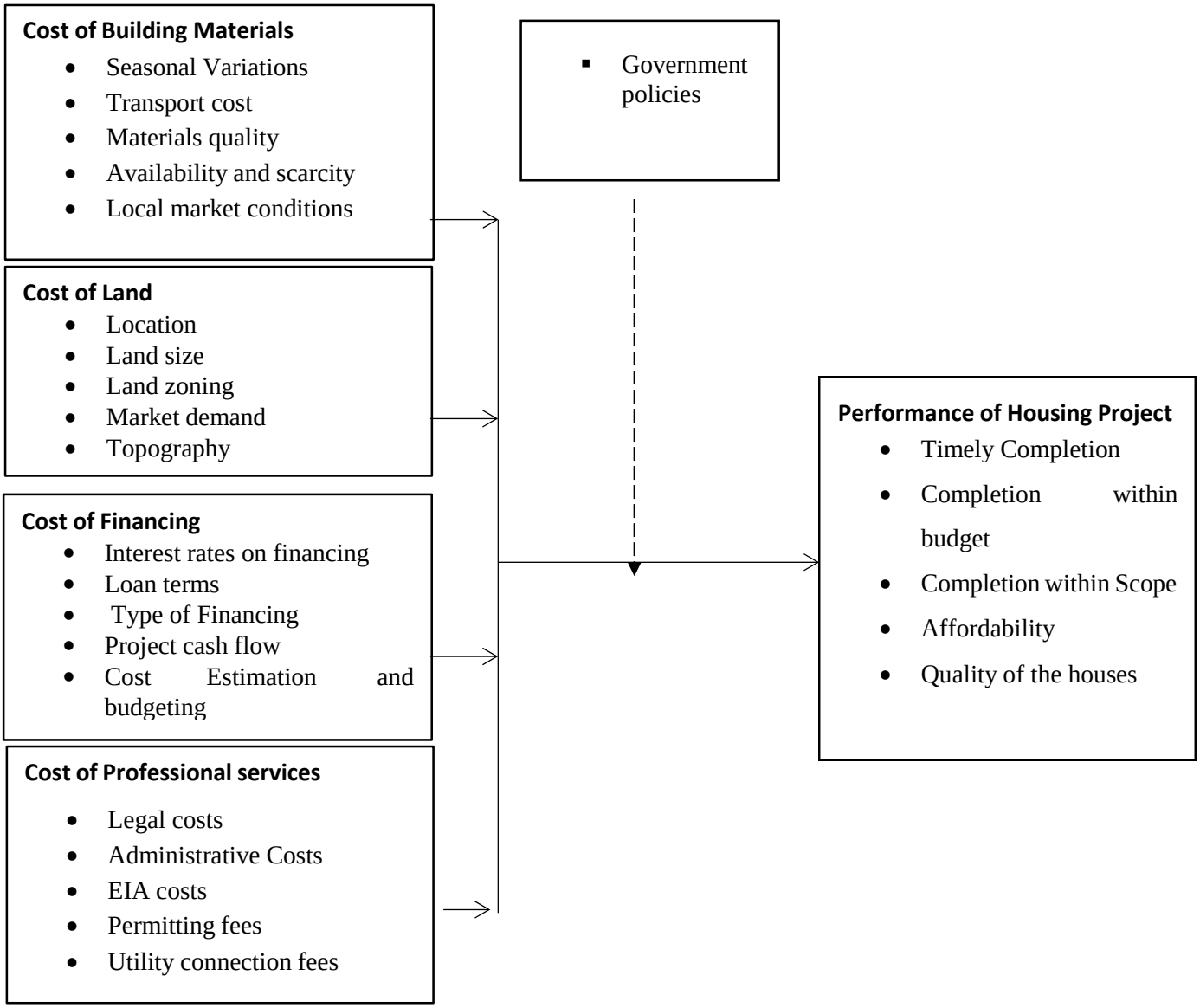
Professional services are essential to the financial environment of housing projects, as emphasized in study by Li and Chen (2018), where costs associated with compliance contribute considerably to project budgets. Additionally, Wang et al.'s work (2019) explores how environmental impact assessments (EIAs) affect project timeframes, highlighting the extra expenses related to ensuring compliance with environmental standards.

In addition, the study by Zhang and Gupta (2021) investigates the function of community involvement and public consultation expenses, illuminating how these regulatory factors might affect the general effectiveness and community relations of housing building projects. Permitting fees and compliance costs are substantial budget contributors for housing projects, according to research by Brown and Patel (2018). Regulatory charges are an essential part of the financial structure of housing projects.

2.4 Conceptual Framework

As explained by Myers (2009), a conceptual framework visually represents the fundamental structures of the variables under investigation and the relationships between them.

Independent Variable **Moderating Variable**



Source. Researcher 2023

2.5 Summary of the Literature

Chapter two provided exploration of relevant literature, encompassing both theoretical perspectives and empirical studies. The study also discussed the agency cost and program theories. It also introduced a conceptual framework that integrated various variables.

Table 2.1 Gaps in literature reviewed

Variable	Author (Year)	Title of the Study	Study Findings	Knowledge Gap	Focus of Current Study
Performance of housing projects	Teja (2020)	Importance of Proper Cost Management in Construction Industry.	The study's conclusions demonstrated the importance of cost control for construction projects in managing project portfolios.	The study examined the construction industry in abstract and it did not focus on housing projects.	This study will focus on the interplay between cost of construction and housing projects' performance.
Performance of housing projects	Divakar and Jebin (2018)	Factors Affecting the Construction Industry's Effective Use of the Cost Management Process.	The study revealed that performance of housing projects is influenced by various factors such as inadequate scope definition and schedule alterations amongst others.	The study did not look at how building costs affected how well housing developments performed.	This study will focus on the interplay between cost of construction and housing projects' performance.
Performance of housing projects	Garcia & Chen (2020)	Evaluating the Impact of Material Quality on the Performance of Construction Projects	The criticality of material quality of constructed projects was underscored.	Research determined how material quality affected housing project performance. However, the study did not look at how building costs affected how well housing developments performed.	The relationship between housing project performance and construction costs will be the focus.

Performance of housing projects	Auma (2017)	A survey of the low-rise buildings in Nairobi's central business district reveals the factors influencing the performance of construction projects in Kenya.	40.962% of the projects experienced a deterioration in budgeted costs,with 20.1% falling within this range. Further, 53.551% of the projects exceeded the budget by 21% to 50%, while 4.551% completed above the budget by more than 50%.	The research demonstrated the beneficial effects of budgeting on housing project building performance. However, the study's primary focus was on residential housing developments' quality and budgeting.	This study will focus on the interplay between cost of building materials, professional services, land and financing and housing projects' performance.
Performance of housing projects	Eglin, T. (2023)	An examination of the prospects and problems in providing cheap and sustainable housing in Nairobi, Kenya from the viewpoint of important players	It was highlighted that constructive interactions with stakeholders contribute immensely to project success and overall performance.	The research was qualitative. It did not however contain conclusive findings.	The objectives of this study will be analyzed by use of descriptive statistical methods.

Performance of housing projects	Ling and Hoi (2018)	The hazards that Singaporean companies encounter when building in India	The study revealed that poor project execution in local government construction projects is mostly due to delays in the issuing of relevant permits.	The study's geographical context was Singapore.	This study's context will be Nairobi County, Kenya.
Cost of Building Materials and Performance of Housing Projects	Sanchezz and Hayas (2018)	Construction management and economics in capital project planning for a circular economy.	The study revealed that challenges in material costs arise from factors such as price fluctuations and delays in supply.	The study exclusively recommended an ICT-based approach, Potentially overlooking other essential cost management practices.	This study will focus on the interplay between cost of construction and housing projects success.
Cost of Building Materials and Performance of Housing Projects	Smith and Brown (2018)	Managing Construction Costs: Strategies for Staying Competitive	The study demonstrated that material prices have a major influence on project budgets and are important for resource allocation and financial feasibility analysis.	The study was qualitative in nature. As such, it lacked conclusive findings.	The objectives of this study will be analyzed by use of descriptive statistical methods like mean, frequency and standard deviation.

Cost of Land and Performance of Housing Projects	Kim & Park (2020)	Risk Analysis of Land Price Changes on Real Estate Development Projects.	Fluctuations in land prices can introduce uncertainties that significantly influence project outcomes.	The main emphasis of the study was how land costs affected housing project performance. However, the study failed to look at how building costs may affect how well housing developments work.	This research will look at how building material, professional service, land, and finance costs affect how well housing projects work.
Cost of Land and Performance of Housing Projects	Zheng & Ren (2021)	Regulatory Costs of Land Acquisition and Urban Infrastructure Provision: A Theoretical Framework and Case Study.	The study highlighted that compliance with land use regulations and zoning requirements can contribute to additional expenses and potential delays in project execution.	The main emphasis of the study was how land costs affected housing project performance. However, the study failed to look at how building costs may affect how well housing developments work.	The interaction between the price of building supplies, expert services, land and funding, and the success of housing projects will be the main topic of this study.

Cost of Financing and Performance of Housing Projects	Smith and Johnson (2019)	Interest Rate Fluctuations and their Implications for Construction Project Financing.	The results of the study demonstrated how much interest rate fluctuations may affect the total cost of borrowing.	The impact of interest rate fluctuations was the main area of interest for the study. However, the study failed to look at how building costs may affect how well housing developments work.	Cost of building materials, professional services, land and financing effect on performance of housing projects will be the key focus.
Cost of Professional Services and Performance of Housing Projects	Gupta and Miller (2020)	Legal and Consulting Costs in Regulatory Compliance: A Case Study of Housing Construction Projects.	The study found that compliance had an effect on project costs.	The study's focused on compliance costs and overlooked the influence of other determinants of cost of construction.	The effect of cost of building materials and other cost determinants will be the main emphasis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The researcher's method for gathering and evaluating data was covered in this chapter.

3.2 Research Design

This research employed descriptive survey research to characterize social phenomena and explore how specific behaviors or occurrences occur. This design was chosen for its precision and accuracy. The descriptive study enabled testing hypotheses and the relationships between the variables. It also enabled the collection and analysis of data using both quantitative and qualitative techniques, as stated by Keman (2020).

3.3 Target Population

The focus of analysis in this study was project managers and contractors in charge of Pangani AHP, Nairobi County Ministry of Infrastructure, Ministry of Lands, Public works and state department of housing and urban development staff.

Table: 3.1: Target Population

Category	Target Population	Percentage
Ministry of Public works	30	20.4%
Nairobi County staff	55	37.4%
Pangani Housing Management Office	10	6.8%
Project Managers & Contractors	22	15%
State Department of Housing	30	20.4%
Total	147	100%

Source: (Pangani Housing Management Office, 2023).

3.4 Sample Size

Sampling method is defined by Adams and Lawrence (2019) as the process of choosing which respondents to survey and in what quantities for a given study.

Using Yamane's (17) formula, the researcher calculated the sample size.

The study's margin of error was five percentage points, with a 95% confidence level.

Equation 1: Sample size calculation formula

$$n = \frac{N}{1+N(e2)}$$

Where;

n = Sample size; N = Population under study; e = 5% error; and 1 =

ConstantThe sample size was calculated as;

$$n = \frac{147}{1+147(0.0025)}$$

n = 108 respondents.

Table: 3.2: Sample Size

Category	Target Population	Percentage	Sample size
Project Managers & Contractors	22	15%	16
Nairobi County staff	55	37.4%	40
Ministry of Public works	30	20.4%	22
Pangani Housing Management Office	10	6.8	8
State Department Housing	30	20.4%	22
Total	147	100%	108

3.5 Data Collection

The technique of data collection used was a structured questionnaire. Coded questionnaires were sent to the respondents. This survey's questionnaire was designed to accommodate a wide range of responders in a diversified sample (Taherdoost, 2016). Interval scales on a five-point Likert scale (1 representing "Strongly Agree" to 5 representing "Strongly Disagree") were used to measure the variables related to the study's primary goals in order to determine the respondents' degrees of agreement. The research also employed an interview schedule to gather data from Pangani Housing Management Officials.

3.6 Data Analysis

We retrieved the field data in Microsoft Excel format, checked it for correctness, and made any necessary adjustments. Utilising descriptive and inferential statistics, the four objectives were examined. Correlation and regression analysis were two forms of inferential analysis that were employed in the study. In addition, SPSS version 22 was employed in the investigation.

The pearson linear correlation coefficient whose formulae is indicated below was used;

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

r is the correlation coefficient, and xi is the sample's values of the X variable.

$\bar{x}$=mean of the x variable's values for the y variable in a sample, where yi ỹ=Mean of the y variable's values.

Lastly, the possible dependence between the various operational variables was investigated using a basic linear regression. The effectiveness of several question scales was assessed using the Cronbach's Alpha Credibility Index.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

Chapter four encompasses analysis of data, presentation in tables, interpretation of evaluated data and discussions.

4.2 Questionnaire return rate

Distribution of questionnaires to the state department of housing and urban development officials, the Nairobi County Ministry of Infrastructure, the Ministry of Lands, the public works department, project managers, and contractors overseeing Pangani AHP was done. Due to the researcher's personal visits to every participant, the return rate was high. The research also employed an interview schedule to gather data from Pangani Housing Management Officials. 96 questionnaires (90.7%) of the distributed questionnaires were correctly returned. Table 4.1 below shows the response rate;

Table 4.1 Response Rate

Category	**Frequency**	**Percentage**
Returned	96	90.7
Not returned	12	9.3
Total	**108**	**100**

4.3 Reliability Results

A reliability test using the Cronbach Alpha Coefficient was done. The determined and summarized results are displayed in Table 4.2.

Table 4.2: Reliability Results

	No. of Items	**Cronbach Alpha Coefficient**
Performance of Housing Projects	5	.865
Cost of building materials	5	.837
Cost of land	5	.887
Cost of Financing	5	.877
Cost of professional services	5	.801

Because the research tool utilized to gather the data for this study had a very high Cronbach's alpha coefficient of more than 0.7, it was considered reliable. The researcher visited the respondents on a frequent basis to inquire about their progress with filling out questionnaires, which significantly improved the content validity of the study tool. To help respondents comprehend the substance of the questionnaire, simple language was also employed when constructing the study tool. These Cronbach's alpha coefficients agree with the dependability criterion of 0.7 and above recommended by Yin (2017).

4.4 Demographic characteristics of respondents

In order to ascertain the participant's personalities in relation to their perception of the reliability and correctness of the details that they supplied, the study collected personal data from the respondents. The researcher aimed to determine the respondents' age, gender, and educational attainment.

4.4.1 Age of the respondents

The study sought to determine the respondents' age. The age ranges of those who responded are as shown in Table 4.3.

Table 4.3: Distribution of respondents by age

Age	Frequency	Percent
20-29	17	17.7
30-39	33	34
40-49	27	28
Above 50	19	20.3
Total	96	100

The study of the data shows that the ages of the participants were dispersed across several groups. 17% of all replies were participants between the ages of 20 and 29. The age group of 30 to 39 years old comprised the biggest proportion of respondents, accounting for 34% of the total. 28% were between 40 to 49 years. 20.3% of respondents were older than 50. This demonstrates that a majority of Kenyans employed in the housing and construction industry are 30 years and above. The finding implies that by the age of 30 years, majority of the respondents have completed their studies and obtained the relevant experience needed in the job market.

4.4.2 Respondents' gender

The researcher sought to establish the gender representation in the construction industry, the respondents' gender was determined. The results are presented in Table 4.4.

Table 4.4: Distribution of respondents by gender

Gender	Frequency	Percentage (%)
Female	38	40
Male	58	60
Total	96	100.0

According to the data, females made up 40% of the responders, while males made up 60%. This indicates that respondents of both sexes participated in the poll. Moreover, this finding implied that there exists professional biasness as a higher percentage of males gravitate more towards the construction industry in comparison with females.

4.4.3 Respondents' academic qualification

The greatest level of academic achievement was examined as shown in Table 4.5 below;

Table 4.5: Respondents' academic qualification

Category	**Frequency**	**Percent**
Certificate	11	11.5
Diploma	27	28
Degree	41	42.7
Postgraduate	17	17.8
Total	96	100

11.5% of the participants polled had a certificate qualification. 28% of respondents possessed a diploma. Of the respondents, 42.7 percent held a degree, while 17.8% were certified postgraduates. This shows that most of the respondents had undergraduate and postgraduate qualifications which is a requirement for the job positions held by the Respondents.

4.5 Descriptive Statistics

Data collected was summarized using percentages, means and standard deviations.

4.5.1 Performance of housing projects

The participants were asked to rank the degree to which the ideas in Table 4.6 align with the housing project performance indicator. This served as the study's dependent variable. Respondents were presented with five constructs to use as indicators for evaluating performance. Table 4.6 below presents the results.

Table 4.6: Performance of housing projects

STATEMENTS	5	4	3	2	1	Mean	SD
Pangani AHP was completed on time.	28.7%	42.6%	11.7%	9.7%	7.3%	4.43	0.632
Pangani AHP was completed within the budgeted funds	20.3%	45.3%	16%	10%	8.4%	4.16	0.641
Pangani AHP was completed as per the scope.	23.6%	35.3%	13.3%	17.1	10.7%	3.94	0.724
The houses are affordable	26.6%	43.3%	13.3%	10.1	6.7%	4.34	0.714
Pangani housing project has good quality houses.	25%	39%	15.3%	12.4%	8.3%	3.96	0.746
Composite/Average mean						4.17	0.690

N=96

From the findings, the participants concurred that the Pangani housing project was finished on schedule, based on the results (Mean=4.43, SD=.632). The majority of participants (Mean=4.16, SD=.641) likewise concurred that the Pangani housing project was finished within the allocated budget. The majority of participants (Mean=3.94, SD=.724) concurred that the Pangani housing project was finished in accordance with its scope and that the costs incurred were reasonable (Mean=4.34, SD=.714). Finally, participants concurred that the houses in the Pangani housing project are of high quality (Mean=3.96, SD=.746).

The average mean for all the assertions was 4.17 whereas the standard deviation was 0.690. This composite mean represents an overall good assessment of the Pangani housing project across all constructs assessed. The low standard deviation suggests a reasonably tight grouping of responses around the mean, implying some level of agreement among respondents.

In addition, insights from interviews with Pangani Housing Management staff corroborate and supplement the survey findings, confirming the good opinion of the housing project's performance. Throughout the interviews, management staff emphasized the project's effective adherence to the specified schedules and cost restrictions. They credited the completion on schedule to thorough planning and efficient project management practices used throughout the building phase. Furthermore, management expressed satisfaction with the project's alignment with the projected scope, emphasizing proactive steps taken to correct any deviations as soon as possible. The staff recognized that cost and quality were areas of attention for continuing development, which corresponded to the nuanced survey results. Overall, the interview replies support the survey data, offering a thorough insight of the housing project's strengths while also identifying areas for future improvement.

4.5.2 Cost of building materials and performance of housing projects

The study's questionnaire contained statements aimed at assessing the degree to which the price of building materials had an impact on performance of housing projects. Table 4.7 below displays the responses;

Table 4.7: Cost of building materials and performance of housing projects

STATEMENTS	5	4	3	2	1	Mean	Std.
The project's ultimate cost is negatively impacted by seasonal fluctuations in the price of building supplies.	22.7%	38.6%	16.4%	11.7%	10.6%	3.82	0.767
Transport cost for the building materials is expensive.	26%	39%	14%	11.3%	9.7%	3.94	0.741
The materials procured for the Pangani housing project were of good quality and affordable	26.1%	34.3%	18.3%	12.3%	9%	3.76	0.725
The building materials were accessible and always available	28.1%	43.3%	14.3%	8.3%	6%	4.16	0.745
Local market conditions for the housing building resources makes it easy to purchase the Materials	10.7%	16.3%	18.3%	34.7%	20%	2.61	0.881
Composite/Average mean						3.65	0.771

N=96

On whether seasonal changes in the pricing of building materials have a detrimental effect on the project's ultimate cost. There were 22.7% who highly agreed, 38.6% who agreed, 16.4% who were indifferent, 11.7% who disagreed and 10.6% who severely disagreed. The total mean rating was 3.82, suggesting that most of the respondents felt that seasonal changes in construction material costs contributed to the ultimate cost of construction.

The second construct on whether transportation cost for the construction components is high was evaluated. 26% of those polled highly agreed, 39% agreed, 14% were neutral, 11.3% disagreed, and 9.7% severely disagreed. The average mean rating was 3.94, showing a fairly high level of agreement that the expense of transporting building materials is significant.

The third indication determined if the materials purchased for the Pangani housing project were of high quality and reasonably priced. According to the results, 26.1% highly agreed, 34.3% agreed, 18.3% were neutral, 12.3% disagreed, and 9% severely disagreed. The total mean assessment was 3.76, signifying that the majority opined that the materials purchased for the Pangani housing project were of good quality and reasonably priced.

The fourth construct sought to determine whether the building materials were accessible. From the findings, 28.1% strongly agreed, 43.3% agreed with the statement, 14.3% were neutral, 8.3% agreed and 6% strongly disagreed. The average mean for the statement was 4.16 indicating a high degree of agreement that the building materials were accessible and always available for the Pangani affordable housing project.

Finally, the fifth construct sought to determine if the local market conditions for the housing building resources makes it easy to purchase the materials. Results showed that 10.7% strongly agreed, 16.3% agreed, 18.3% were neutral, 34.7% disagreed while 20% strongly disagreed. The average mean rating was 2.61, suggesting that most respondents disagreed that local market conditions for the housing building resources makes it easy to purchase the materials.

The composite or average mean for all statements is calculated at 3.65, with a standard deviation of 0.771. This suggests a moderate overall agreement among respondents regarding the influence of cost, transportation, quality, availability, and local market conditions on the procurement of building materials for the Pangani housing project. The standard deviation indicates a degree of variability in opinions across these factors.

Insights obtained from the interview schedule with Pangani Housing Management staff connect with respondents' issues and opinions. The staff recognized the difficulties created by seasonal changes in building material costs, emphasizing the importance of strategic planning to manage potential financial implications. Transportation costs were highlighted as a key element impacting the entire cost of building supplies, matching survey responses. Furthermore, management reaffirmed that materials procured were of high-quality and cost-effective. The acknowledgement of easily accessible building supplies matched the favorable emotion expressed in the survey, emphasizing the importance of accessibility in maintaining the smooth continuation of the housing project. However, diverse perceptions about local market circumstances arose throughout the interviews, echoing the varied viewpoints observed in the survey data. These interview insights add essential qualitative context to the quantitative data, supporting and elaborating on the varied opinions expressed.

4.5.3 Cost of land and performance of housing projects

The effect of land related costs on performance of Pangani AHP was examined and the responses presented in Table 4.8 below.

Table 4.8 Cost of land and performance of housing projects

STATEMENTS	5	4	3	2	1	Mean	Std
The location of the Pangani AHP made purchase of land expensive	29.7%	40.6%	10.4%	10.7%	8.6%	4.32	0.667
The land was adequate for the Pangani AHP	15%	16%	15%	36.3%	18.7%	2.33	0.842
Land zoning made it expensive to procure land for the Pangani AHP	25%	34.3%	14.3%	15.3%	10.1%	3.88	0.822
Market demand for land at Pangani area made it expensive to get land for the Pangani AHP	28%	36.3%	14.3%	12.3%	8.1%	4.00	0.812
The land topography made it affordable to construct the houses.	23.7%	30.3%	16.3%	15.7%	14%	3.81	0.812
Composite/average mean						**3.67**	**0.766**

N=96

On whether the Pangani AHP's location makes land purchasing pricey, there were 29.7% who strongly agreed, 40.6% who agreed, 10.4% who were indifferent, 10.7% who disagreed, and 8.6% who severely disagreed. The total mean rating was 4.32, suggesting that the most of the participants thought that the Pangani AHP's location made land purchasing costly.

The second structure determined if the land was enough for the Pangani housing project. 15% strongly agreed, 16 agreed, 15% of the respondents were neutral, 36.3% disagreed while 18.7% strongly disagreed that the land was adequate for the Pangani housing project. The average mean rating was 2.33, indicating a majority of the respondents disagreed.

The third indication looked at whether land zoning made acquiring land for the Pangani housing project more expensive. According to the results, 25% highly agreed, 34.3% agreed, 14.3% were neutral, 15.3% disagreed, and 10.1% severely disagreed. The total mean rating was 3.88, indicating that the majority believed that land zoning made acquiring land costly.

The fourth component aimed to ascertain whether the market demand for property in the Pangani area rendered acquiring land for the housing project too expensive. According to the data, 28% highly agreed, 36.3% agreed, 14.3% were indifferent, 12.3% agreed, and 8.1% strongly disagreed. The average mean for the statement was 4.00 indicating a high degree of agreement that market demand for land at Pangani area made it expensive to get land.

Finally, the fifth construct sought to determine if the land topography made it affordable to construct the houses. Results showed that 23.7% strongly agreed, 30.3% agreed, 16.3% were neutral, 15.7% disagreed while 14% strongly disagreed. The average mean rating was 3.81, suggesting that most respondents agreed that the land topography made it affordable to construct the houses.

3.67 is the composite or average mean for all assertions. This reflects respondents' modest general agreement on the impact of land-related issues on the performance of the Pangani affordable housing project. The standard deviation point to the fact that there is some variation in opinions across these parameters.

In line with the findings in the survey, perspectives gained from interviews with Pangani Housing Management staff recognized the geographical issue provided by the Pangani affordable housing project's location, blaming the high cost of site purchase to local demand and zoning laws. The respondents reiterated the thoughts revealed in the survey data, emphasizing the crucial importance of the project's geographical context in influencing the cost of land, which aligned with the survey's strong consensus.

Furthermore, staff members stressed the relevance of market demand and zoning constraints as major factors of land costs throughout the interviews, which coincided with survey results. The management staff's identification of these aspects offers qualitative support to the quantitative data, reaffirming respondents' view that market circumstances and zoning rules greatly contributed to the problems connected with land purchase expenses.

These similar viewpoints across survey respondents and interviewers highlight the validity and breadth of the discovered patterns regarding land-related issues impacting the effectiveness of the Pangani AHP.

4.5.4 Cost of financing and performance of housing projects

The effect of financing cost on performance of Pangani AHP was examined and the responses presented in Table 4.9 below.

Table 4.9: Cost of financing and performance of housing projects

STATEMENTS	5	4	3	2	1	Mean	Std.
The interest rates on financing for the Pangani AHP is low	10.7%	16.6%	12.4%	38.7%	21.6%	2.21	0.825
The loan terms for the Pangani AHP are flexible.	10%	20.3%	28%	22%	20.7%	3.11	0.801
The financing type for the Pangani AHP made it easier to complete the project	23%	34.3%	19.3%	14.3%	9.1%	3.80	0.705
There is adequate cash flows from the Pangani AHP to repay the financing loans	9.1%	16.3%	17.3%	34.3%	23%	2.50	0.835
Cost estimations and budgeting for the Pangani AHP was adequately done	20.7%	38.3%	15.3%	12.7%	13%	3.81	0.727
Composite/Average mean						**3.08**	**0.779**

N=96

The first construct attempted to ascertain whether the interest rates on funding for the Pangani affordable housing project were low. 10.7% agreed strongly, 16.6% agreed, 12.4% agreed, 38.7% disagreed, and 21.6% strongly disagreed. The aggregate mean rating was 2.21, suggesting that the remark was disagreed with by the majority of respondents.

The second component determined whether or not the financing arrangements for the Pangani AHP are flexible. 10% of respondents strongly agreed, 20.3% agreed, 28% agreed, 22% disagreed, and 20.7% strongly disagreed. The average mean rating was 3.11, showing that the majority of respondents were unsure about the loan arrangements for the Pangani AHP.

The third indicator analyzed whether the Pangani project's funding method made it simpler to finish. According to the results, 23% highly agreed, 34.3% agreed, 19.3% were neutral, 14.3% disagreed, and 9.1% strongly disagreed. The total mean rating was 3.80, indicating that majority agreed that the kind of financing made it simpler to execute the project.

The fourth construct tried to ascertain whether the Pangani AHP generates sufficient cash flows to repay the finance debts. According to the data, 9.1% highly agreed, 16.3% agreed, 17.3% were indifferent, 34.3% agreed, and 23% strongly disagreed. The average mean for the statement was 2.50 indicating that majority of the respondents disagreed that there was adequate cash flows from the Pangani AHP to repay the financing loans.

Finally, the fifth construct sought to determine if the cost estimations and budgeting for the Pangani AHP was adequately done. Results showed that 20.7% of respondents strongly agreed, 38.3% agreed, 15.3% were neutral, 12.7% disagreed while 13% strongly disagreed. The average mean rating was 3.81, suggesting that most respondents agreed that the cost estimations and budgeting for the Pangani AHP was adequately done.

The composite or average mean for all statements is calculated at 3.08. This indicates a neutral perception among respondents regarding the influence of financing-related factors on the performance of the Pangani affordable housing project. The standard deviation suggests a degree of variability in opinions across these factors.

In a similar fashion to the survey, the interview schedule with Pangani housing management staff provide more light on the perceived high interest rates on finance. The respondents reiterated that high interest rates provided a substantial obstacle to the project's overall affordability. This agreement between survey and interview replies demonstrates a common grasp of the difficulties of funding and its consequences for the Pangani affordable housing project's viability. Additionally, during the interviews, management staff highlighted the importance of flexible loan terms in navigating the financial landscape. While acknowledging the diversity of perspectives on this aspect, staff members emphasized ongoing efforts to negotiate favorable terms with financial institutions, aiming to strike a balance between project needs and financial constraints. The recognition of the nuanced nature of loan terms aligns with the varied opinions identified in the survey, emphasizing the significance of flexibility in financing arrangements. Overall, the qualitative insights from the interview schedule complement and enrich the quantitative findings, providing a comprehensive understanding of the intricate dynamics surrounding financing and its impact on the performance of the Pangani affordable housing project.

4.5.5 Cost of professional services and performance of housing projects

The study evaluated how cost of professional services affect Pangani housing project's performance. The study results are shown in Table 4.10 below.

Table 4.10: Cost of professional services and performance of housing projects

STATEMENTS	5	4	3	2	1	Mean	Std.
The legal costs for the Pangani AHP were low.	25.6%	42.7%	14.4%	10.6%	8.7%	4.22	0.707
The administrative costs for the project were low.	31%	39%	10%	13.3%	6.7%	4.27	0.721
The Environmental Impact Assessment costs for the project were low.	25.1%	37.3%	15.3%	12.3%	10%	3.85	0.726
The Permitting costs for the Pangani AHP were low	28.1%	41.3%	11.3%	12.3%	7%	4.15	0.735
The utility connection fees for the Pangani AHP were low	12.7%	14.4%	22.3%	31.7%	18.9%	2.44	0.886
Composite/Average mean						**3.79**	**0.755**

N=96

The goal of the first construct was to ascertain if the Pangani AHP's legal expenses were reasonable. 42.7% agreed, 14.4% were indifferent, 10.6% disagreed, and 8.7% strongly disagreed, out of 25.6% who strongly agreed. Majority of the participants believed that the legal fees were modest, as indicated by the overall mean rating of 4.22.

The second component evaluated how cheap the projects' administrative expenses were. 31% strongly agreed, 39% agreed, 10% of the respondents were neutral, 13.3% disagreed while 6.7% strongly disagreed. The average mean rating was 4.27, indicating a majority of the individuals polled agreed that the administrative costs for the projects were low.

The third criteria determined if the project's environmental impact assessment expenses were minimal. 25.1% of the participants highly agreed, 37.3% agreed, 15.3% were indifferent, 12.3% disagreed, and 10% severely disagreed. The total mean rating was 3.85, indicating that the majority thought the project's environmental impact assessment expenses were modest.

The fourth indicator tried to ascertain whether the Pangani AHP's permitting expenses were minimal. From the findings, 28.1% strongly agreed, 41.3% agreed, 11.3% were neutral, 12.3% agreed and 7% strongly disagreed. The average mean for the statement was 4.15, showing that the majority of survey’s participants believed that the AHP permit charges were cheap.

Finally, the final component investigated if the utility connection rates for the Pangani AHP were reasonable. According to the results, 12.7% highly agreed, 14.4% agreed, 22.3% were indifferent, 31.7% disagreed, and 18.9% severely disagreed. The average mean rating was 2.44, indicating that the majority of participants disagreed that the Pangani AHP's utility connection costs were cheap.

3.79 is the composite or average mean for all assertions. This suggests that respondents are generally favorable about the influence of professional service prices on performance of the Pangani AHP.

During the interviews, Pangani Housing Management staff credited this efficiency to strategic relationships with legal and administrative specialists, which helped to streamline procedures and save costs. The interviewers also highlighted the difficulties connected with the expenses of Environmental Impact Assessment (EIA), mirroring the nuanced viewpoint indicated in the survey results.

This convergence of survey and interview data provides a comprehensive understanding of the challenges and opportunities associated with professional service costs in the context of affordable housing projects.

4.6 Inferential Statistics

Karl Pearson correlation coefficient and regression analysis were applied in this research.

4.6.1 Correlation Analysis

Using Karl Pearson correlation coefficient, this study examined the strength of association between the variables. The correlation between the various determinants of cost of construction and performance of housing projects is as shown in Table 4.11 below.

Table 4.11 Correlation Matrix

	Performance of housing projects	**Cost of building materials**	**Cost of Land**	**Cost of Financing**	**Cost of professional services**
Performance of housing projects	1	.702**	.605**	.733**	.584**
Sig. (2-tailed)	.	.000	.000	.001	.000
N	96	96	96	96	96
Cost of building materials	.702**	1	.560**	.670**	.540**
Sig. (2-tailed)	.000	.	.000	.000	.000
N	96	96	96	96	96
Cost of Land	.605**	.560**	1	.613**	.600**
Sig. (2-tailed)	.000	.000	.	.000	.000
N	96	96	96	96	96
Cost of Financing	.733**	.670**	.613**	1	.557**
Sig. (2-tailed)	.001	.000	.000	.	.000
N	96	96	96	96	96
Cost of professional services	.584**	.540**	.600**	.557**	1
Sig. (2-tailed)	.000	.000	.000	.000	.
N	96	96	96	96	96

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

4.6.1.1 Cost of building materials and performance of housing projects

Table 4.11 revealed a strong positive association (r=.702 N=96 p.01) between the cost of building materials and the performance of housing projects. This finding is similar with the supposition of Hazhar (2020) who found that the interaction between the cost of building materials and project performance is an important part of construction management. Material costs account for a sizable component of the entire project budget, determining financial sustainability and resource allocation. Fluctuations in material costs can impact project timelines, quality of construction, and the ability to adhere to budgetary constraints. Effective management of material costs involves not only procurement at the best possible prices but also considerations of material availability, quality, and sustainability. The choice of building materials directly affects the structural integrity, durability, and overall performance of the constructed project. Balancing cost considerations with the need for high quality materials is a delicate yet pivotal task for project managers.

The findings of the study regarding seasonal variations, transportation costs, quality and affordability of materials resonate with the recognized challenges in construction projects (Cheng et al., 2018; Oyedele et al., 2018). Seasonal fluctuations in material prices have been acknowledged as a common risk factor that can impact project budgets and timelines (Doloi, 2012). Similarly, the emphasis on transportation costs as a significant contributor to the overall expenses in construction projects is consistent with the literature highlighting logistical challenges in material procurement (Li et al., 2019). The nuanced perspectives on material quality and affordability align with studies emphasizing the importance of balancing cost considerations with the need for durable and cost-effective materials in construction.

Furthermore, the results are also consistent to another study conducted by Garcia and Chen (2020) which underscores the criticality of material quality in determining performance of constructed projects, adding another layer of complexity to the material selection process. As demonstrated in these scholarly investigations, a thorough understanding of the interplay between material costs and performance of housing projects is essential for effective project management and risk mitigation.

4.6.1.2 Cost of land and performance of housing projects

The findings in Table 4.11 on the effect of land-related factors on the performance of housing projects are consistent with Akintoye et al. (2013) research which emphasized on the importance of geography in influencing land acquisition costs, lending credence to survey findings that emphasized the influence of the Pangani housing project's geographical setting on the cost of obtaining land. The study affirms that the geographic context significantly contributes to the variations in land costs, echoing the sentiments expressed by both survey respondents and Pangani Housing Management staff.

Moreover, the concerns raised by participants about the impact of market demand on land acquisition costs find resonance in studies such as those by Hui et al. (2017) and Oto et al. (2016). Hui et al. (2017) highlight the direct relationship between market demand and land prices, emphasizing the influence of market forces on the affordability of land. Similarly, Oto et al. (2016) discuss the implications of market-driven dynamics on land costs, supporting the contention that the Pangani housing project's challenges in acquiring affordable land are consistent with broader industry trends. The role of zoning regulations in contributing to the expensive nature of procuring land for the housing project aligns with insights from research by Ratcliffe et al. (2017) which underscores the impact of zoning policies on land availability and costs.

4.6.1.3 Cost of financing and performance of housing projects

Table 4.11 above shows a very strong positive relationship (r=.733 N=95 p.01) between performance of housing projects and the influence of financing costs. The correlation coefficient is high, at 0.733. The significance level (p-value) of the correlation coefficients is.001, which is less than 0.01. This indicates that there is a high level of statistical significance. The high correlation coefficient implies that the cost of financing and the success of housing developments are inextricably linked.

The results above are similar to a number of studies. For instance, the study by Chen et al. (2020) delves into the implications of different financing structures on performance of housing projects, indicating that the choice between debt and equity financing impacts financial sustainability of housing construction projects (Chen et al., 2020). Moreover, the work of Brown and Williams (2021) underscores the importance of considering macroeconomic factors such as financing models in assessing profitability of projects (Brown & Williams, 2021).

The findings from the interview schedule also resonate with Gupta & Belinda (2018) who proffered that the project owner ought to determine project financing from the beginning and authorize the highest possible finance budget. Allocating resources in the construction industry is crucial for meeting project goals of quality and timely completion. These resources include goods and materials, machinery and tools, personnel, space, subcontractors, and money. Li and Wang (2018) underscore that the composition of loan terms and conditions holds substantial influence on project outcomes, emphasizing that factors such as interest rates and repayment periods are pivotal in shaping the financial viability and success of housing projects (Li & Wang, 2018).

4.6.1.3 Cost of professional services and performance of housing projects

Table 4.11 shows that there was a substantial positive association (r=.584 N=95 p.01) between the cost of professional services and the performance of housing projects. The correlation study's conclusions demonstrate a positive relationship between the cost of professional services and the success of housing projects.

The findings above align with research by Shen et al. (2020) who underscores the critical role of streamlined legal services in enhancing project performance. The study emphasizes that strategic legal partnerships contribute to cost-effectiveness, aligning with the positive perceptions expressed by survey participants and Pangani Housing Management staff regarding the low legal costs for the affordable housing project.

Moreover, the study's findings are similar to those by Wang et al. (2018) and Zhang et al. (2019) who highlight the significance of well-managed administrative services in optimizing project outcomes. In addition, the challenges associated with Environmental Impact Assessment (EIA) costs highlighted in this study's findings align with recent research by Brown et al. (2017). Their study delves into the complexities and costs associated with EIA processes in construction projects, emphasizing the need for continuous optimization and strategic planning.

4.6.2 Regression Analysis

A coefficient of determination (R2) was employed to determine if the determinants of the independent variable were a significant predictor of performance of housing projects.

4.6.2.1 Cost of building materials and performance of housing projects

The coefficient of determination for cost of construction and performance of housing projects is as shown in Table 4.12 below.

Table 4.12 Regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.702[a]	.664	.601	.565

Predictors: (*Constant*), cost of building materials, Dependent variable: Performance of housing projects

The results of the correlation study in Table 4.12 above show that the performance of housing projects and the cost of building materials have a high positive association (R = 0.702). The housing project's performance varies, and the R Square value of 0.664 shows that fluctuations in building material costs account for around 66.4% of this variance, indicating a substantial effect. A more accurate evaluation of the model's fit may be found in the modified R Square, which is 0.601 once predictor factors are taken into consideration. To ascertain the importance of construction material cost as a predictor of housing project performance, an ANOVA test was performed in Table 4.13 below.

Table 4.13 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110.204	1	110.204	101.615	.000[b]
	Residual	121.117	94	.874		
	Total	231.321	95			

The statistical analysis [F (1, 94) = 101.615, P<.05] in Table 4.13 highlights the strong influence of building material cost on housing project performance, establishing it as a significant predictor. The regression model's sum of squares, which explains the variation in housing project performance due to building material costs is 110.204.

4.6.2.2 Cost of land and performance of housing projects

Results for the coefficient of determination for the two variables are presented in Table 4.14.

Table 4.14 Regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.605[a]	.521	.482	.405

a. Predictors: (Constant), Cost of land

According to Table 4.14 above, the R value is 0.605, indicating a strong effect of cost of land on the performance of housing projects. Moreover, the cost of land accounts for 52.1% of the variations in performance of housing projects. This demonstrates how significantly cost of land affects performance of housing projects. An ANOVA test was conducted as shown in Table 4.15 below.

Table 4.15 ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	110.095	1	110.095	122.141	.000[b]
	Residual	121.226	94	.662		
	Total	231.321	95			

Table 4.15 shows that the cost of land is an important indicator of housing project success, with [F (1, 94) = 122.141, P<.05.

4.6.2.3 Cost of financing and performance of housing projects

The coefficient of determination results for the two variables are presented in Table 4.16 below.

Table 4.16 Regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.733[a]	.672	.593	.483

a. Predictors: (Constant), cost of financing

As shown in Table 4.16, performance of housing projects is significantly improved by cost of financing (R value of.733). The R Square value of 0.672 indicates that the cost of financing may be responsible for about 67.2% of the variation in housing project performance.

The relevance of financing costs as a predictor of housing project success was assessed using an ANOVA test as shown in Table 4.17 below.

Table 4.17 ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	127.919	1	127.919	140.133	.000[b]
	Residual	103.402	94	.609		
	Total	231.321	95			

The cost of financing is a strong predictor of housing project success, as demonstrated by Table 4.17 [F (1, 94) = 140.133, P.05].

4.6.2.4 Regression analysis for cost of professional services and performance of housing projects

The strength of the two variables was analysed as demonstrated in Table 4.18 below.

Table 4.18: Regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.584[a]	.535	.502	.481

Predictors: (Constant), Cost of professional services

The performance of housing projects is significantly impacted by professional service charges, as shown by the R value of .584 in Table 4.18. The R Square value of .535 suggests that changes in the cost of professional services account for 53.5% of the variation in the performance of housing projects. An ANOVA test as shown in Table 4.19 below was done to further investigate the usefulness of professional service costs as a key indicator of housing project performance.

Table 4.19: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	111.199	1	111.199	133.110	.000[b]
	Residual	120.122	94	.606		
	Total	231.321	95			

a. Dependent Variable: Performance of housing projects
b. Predictors: (Constant), Cost of professional services

From Table 4.22 above where [F (1, 94) = 133.110, P<.05] it is evident that cost of professional services influence performance of housing projects and thus a significant predictor.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The findings of this study are summarized in this chapter, along with recommendations.

5.2 Summary of findings

This study's objective was to examine the influence of cost of building materials, financing, land and professional services on performance of housing projects such as Pangani AHP.

5.2.1 Cost of building materials and performance of housing projects

From the findings, there is a substantial and positive correlation of 70.2% between cost of building material costs and performance of housing projects. The average mean for all assertions is 3.65 with a standard deviation of 0.771. This indicates that respondents have a modest general agreement that the cost of building materials has a significant effect on performance of Pangani AHP.

5.2.3 Cost of land and performance of housing projects

According to the findings, there is a positive relationship of 60.5% between the cost of land and performance of housing projects. The link was statistically significant, based on the high degree of significance (p.01). The composite mean of all assertions was 3.67 with a standard deviation of 0.766. This reflects respondents' general agreement that cost of land influences performance of the Pangani AHP.

5.2.4 Cost of financing and performance of housing projects

From the findings of the study, there is a very strong positive relationship of 73.3% between the cost of financing and performance of housing projects. The high correlation coefficient implies that financing-related costs influenced performance of Pangani AHP. The composite mean was estimated to be 3.08 with a standard deviation of 0.779. The significance level (p-value) of the correlation coefficients was.001 indicating a high level of statistical significance.

5.2.4 Cost of professional services and performance of housing projects

From the findings, the average mean of all the assertions regarding cost of professional services is 3.79 with a standard deviation of 0.755. There was a substantial positive correlation between housing project performance and professional services' costs (r=.584 N=95 p.01) which implies that the cost of professional services and performance of housing projects is linked.

5.3 Conclusion

The study concludes that the cost of building materials has a major influence on the performance of housing projects. The participants agreed on the majority of the assertions in the questionnaire. For example, the majority of respondents felt that seasonal changes in the cost of building materials have a negative effect on the ultimate cost of the project and that building supplies were easily accessible and constantly available. However, the respondents disagreed that the local market conditions for the housing building resources makes it easy to purchase the materials.

In addition, it was demonstrated that the cost of land has a significant impact on the performance of housing projects. The research revealed that the Pangani affordable housing project's location rendered purchasing land too expensive. Majority of the participants also agreed that land zoning made acquiring land more expensive. They, however, disagreed that there was enough land for the Pangani housing project.

Further, the study revealed that financing cost has a significant influence on the performance of housing projects. According to the data, the respondents believed that the Pangani AHP financing type made it simpler to execute the project, and the cost predictions and budgeting for the Pangani AHP were appropriate. Nonetheless, the respondents disputed that interest rates on the Pangani AHP were cheap and that the Pangani AHP generated enough income to repay the financing loans.

Finally, the study concludes that performance of housing projects is significantly influenced by cost of professional services. Respondents agreed that the legal and administrative costs, environmental impact assessments and permitting costs were low. However, they disagreed that the utility fees were low.

5.4 Recommendations

Firstly, this study suggests that strategic sourcing and procurement practices be used. This entails forming alliances with dependable suppliers, investigating bulk purchasing possibilities, and using technology for real-time market analysis. The project can achieve more financial stability and prevent unanticipated issues linked to material accessibility by proactively controlling material costs and minimizing the impact of seasonal changes.

Secondly, a full examination of land availability and zoning restrictions is required to solve the issues connected with the cost of property. Engaging with local planning authorities to better understand and perhaps alter zoning rules can help to improve land acquisition circumstances. Furthermore, strategic land acquisition planning that considers market demand, topography, and the perceived sufficiency of land for the housing project can improve overall project feasibility.

Thirdly, there is a need to investigate various funding possibilities and negotiate favorable terms with financial institutions. This involves actively pursuing cheaper mortgage rates, arranging flexible loan terms, and developing strong cash flow management procedures. Proactive interaction with financial partners and ongoing monitoring of financial performance can help to make a housing project more sustainable and financially feasible.

Further, it is necessary to participate in strategic talks with professionals and service providers. This includes looking for cost-cutting options, negotiating favorable pricing arrangements, and identifying partnerships that correspond with the project's aims. Proactive discussion with suppliers and an in-depth investigation of alternative utility choices can help to reduce costs by aligning prices with the overall financial goals of the housing project.

5.5 Suggestions for further studies

Another research may be done to investigate the local market circumstances influencing construction material purchase. Investigate the elements that influence pricing changes, supplier dynamics, and geographical variances. Another study should be conducted to examine different financing models employed in affordable housing projects. Evaluate the successes and challenges associated with various financing strategies.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION

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Our Ref**. L50/37090/2020** **October 21, 2023**

National Commission for Science, Technology and Innovation
NACOSTI Headquarters
Upper Kabete, Off Waiyaki Way
P. O. Box 30623- 00100
NAIROBI

RE: INTRODUCTION LETTER: ESTHER NDUTA NGARI

The above named is a registered Masters of Arts in Project Planning and Management candidate at the University of Nairobi, Faculty of Business and Management Sciences. She is conducting research on ***"COST OF CONSTRUCTION AND PERFORMANCE OF HOUSING PROJECTS IN NAIROBI COUNTY, KENYA: A CASE OF PANGANI HOUSING PROJECT".***

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the Project.

The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your co-operation will be highly appreciated.

P. O. Box 30197-00100, Nairobi

PROF. JAMES NJIHIA
DEAN, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES

JN/pgr

Appendix II: Questionnaire for project managers, contractors, County staff, Ministry of Public Works staff, State Department staff and the residents of the Pangani Housing Projects.

Part A: General Information

Introduction

This research aims to examine the correlation between the cost of construction and the overall performance of the Pangani housing project in Nairobi County, Kenya. Your candid and accurate responses to the following questions are crucial for gaining valuable insights into the dynamics of this relationship. Your input will significantly contribute to the thorough understanding of how construction costs influence the outcomes of the Pangani housing project, thereby aiding in the comprehensive analysis of performance of housing projects in Kenya. Your cooperation is highly appreciated, and your input will play a vital role in enhancing the quality and depth of this study.

Section A: Demographic Information (Tick appropriately)

1. Tick your gender Male ( ) Female( )

2. Tick your age

Below 20 yrs. ( ) 21- 30 Yrs. ( )

31 - 40 yrs. ( ) 40- 50 Yrs. ( )

Over 50 Years ( )

3. What is your highest level of education

None ( ) KCPE ( ) KCSE ( )
Certificate ( ) Diploma ( ) Bachelor's Degree ( )
Master's Degree ( ) PhD Degree ( )

Other specify ( ) ……

PART B: Performance of Housing Projects

In evaluating the performance of housing projects, show your level of agreement or disagreement: Scale: 5 for Strongly Agree, 4 for Agree,3 for Undecided, 2 for Disagree, and 1 for Strongly Disagree.

	Statement	**5**	**4**	**3**	**2**	**1**
	Performance of Housing Projects					
(a)	Pangani housing project was completed on time					
(b)	The Pangani housing project was completed within the budgeted funds					
(c)	Pangani housing project was completed as per the scope					
(d)	The houses are affordable					
(e)	Pangani housing project has good quality houses					

PART C: Cost of construction and its influence on performance of housing projects.

	Statement	5	4	3	2	1
	Cost of building Materials					
(a)	The seasonal variations on the cost of building materials have a negative effect on the final cost of the project					
(b).	Transport cost for the building materials is expensive					
(c)	The materials procured for the Pangani housing project were of good quality and affordable					
(d).	The building materials were accessible and always available					
(e)	The local market conditions for the housing building resources makes it easy to purchase the materials					

	Statement	5	4	3	2	1
	Cost of land					
(a)	The location of the Pangani affordable housing project made purchase of land expensive					
(b).	The land was adequate for the Pangani housing project					
(c)	Land zoning made it expensive to procure land for the Pangani housing project					
(d).	Market demand for land at Pangani area made it expensive to get land for the Pangani housing project					
(e)	The land topography made it affordable to construct the houses					

	Statement	5	4	3	2	1
	Cost of Financing					
(a)	The interest rates on financing for the Pangani affordable housing project is low					
(b).	The loan terms for the Pangani AHP is flexible					
(c)	The financing type for the Pangani AHP made it easier to complete the project					
(d).	There is adequate cash flows from the Pangani AHP to repay the financing loans					
(e)	Cost estimations and budgeting for the Pangani AHP was adequately done					

	Statement	5	4	3	2	1
	Cost of Professional Services					
(a)	The legal costs for the Pangani AHP were low					
(b).	The administrative costs for the project were low					
(c)	Environmental Impact Assessment costs for the project were low					
(d).	Permitting costs for the Pangani AHP were low					
(e)	The utility connection fees for the Pangani AHP were low					

Appendix II: Interview Schedule for the Pangani Housing Management Officials

How does the cost of construction materials affect the success of the Pangani Housing Project?

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How did the cost of land influence the performance of Pangani Housing Project?

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What effect does the cost of financing have on the performance of the Pangani Housing Project?

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How does the cost of professional services affect the Pangani Housing Project's performance?

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Kindly comment on the performance of Pangani Housing Project in terms of its completion time, budget, scope, affordability and the quality of the houses

……

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……

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……

……

……

……

……

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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Date of Issue: **03/November/2023**

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