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STRATEGIC APPROACHES AND PERFORMANCE OF CONSTRUCTION INDUSTRY IN KIAMBU COUNTY, KENYA

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ABSTRACT

The construction industry plays a pivotal role in the economic development of Kenya, significantly contributing to both the country's GDP and employment creation. However, the construction industry in Kiambu County, Kenya, faces several challenges that impact the delivery of projects, cost efficiency, and the overall quality of work. These challenges are multifaceted and require targeted solutions to ensure sustainable growth in the sector. The general objective of the study is to determine the influence of strategic approaches on performance of construction industry in Kiambu County, Kenya. Specifically, the study sought to determine the influence of resilience on performance of construction industry in Kiambu County, Kenya and to determine the influence of innovation on performance of construction industry in Kiambu County, Kenya. This study was anchored on Social Cognitive Theory and Diffusion of Innovations Theory. This study adopted a descriptive research design. This study was conducted in the construction industry in Kiambu County, Kenya. According to National construction authority (2024) there are 124 on-going projects in the construction industry in Kiambu County, Kenya. The study targeted project managers and contractors in each project hence the total population was 248 respondents. Since the target population is small, the study used census method hence all the 248 respondents participated in the study. This research used a questionnaire to collect primary data. A pilot test was conducted to assess the questionnaire's validity and reliability of the data that was collected. The study collected quantitative data from closed- ended questions. The analysis involved both the descriptive and inferential statistics using the Statistical Package for Social Sciences (SPSS) version 24. The collected data was further analyzed using multi linear regression to determine the relationship between the dependent and independent variables. The data presentation was done by use of tables and figures. The study concludes that resilience has a positive and significant effect on performance of construction industry in Kiambu County, Kenya. In addition, the study concludes that innovation has a positive and significant effect on performance of construction industry in Kiambu County, Kenya. Based on the findings, the study recommends that the management of construction industry in Kenya should prioritize building organizational resilience through strategic planning and risk management. By developing a robust framework that anticipates potential challenges, construction companies can mitigate risks and maintain steady performance even in volatile conditions.

Key Words: Strategic Approaches, Resilience, Innovation Performance of Construction Industry

Background of the Study

The construction industry is a broad and dynamic sector that involves the creation, alteration, repair, and maintenance of structures and infrastructure essential to modern society. It includes a diverse range of projects such as residential homes, commercial buildings, factories, roads, highways, bridges, railways, airports, dams, and water supply systems (Roshayati *et al*, 2022). This industry operates through several phases each requiring the expertise of various professionals including architects, civil engineers, project managers, quantity surveyors, skilled tradespeople, and laborers. It also heavily depends on suppliers and manufacturers of building materials, machinery, and equipment (Julio *et al*, 2023). The construction industry not only contributes significantly to a country's GDP but also drives employment and supports other sectors like manufacturing, transportation, and real estate.

The construction industry plays a crucial role in the development and advancement of modern societies. One of its most significant contributions is the creation of physical infrastructure that supports economic and social activities (Jill & Bram, 2024). This includes the building of roads, bridges, railways, airports, ports, and energy facilities, which are essential for transportation, trade, and communication. Without such infrastructure, economic development would be hindered, as businesses rely heavily on efficient logistics and access to utilities. Additionally, public infrastructure projects often stimulate economic growth by attracting investment and increasing productivity across various sectors (Low & Chong, 2021). The construction industry is central to providing shelter and improving living conditions. It is responsible for the development of residential housing, schools, hospitals, and recreational facilities, all of which contribute to a higher quality of life (Okonicha & Okwuanaso, 2024). The industry also supports urbanization by shaping city landscapes and enabling population growth in both rural and urban areas. As populations increase, the demand for sustainable and affordable housing becomes more pressing, and the construction sector must adapt by incorporating green building techniques and innovative design solutions that meet modern standards of energy efficiency and environmental sustainability (Kabiru & Irechukwu, 2023).

Strategic approaches refer to carefully planned and systematic methods or frameworks that individuals, organizations, or governments use to achieve specific long-term goals and objectives. These approaches involve analyzing internal strengths and weaknesses, assessing external opportunities and threats, and then developing a roadmap that aligns available resources with desired outcomes (Ibrahim, Kyando & Kiwonde, 2023). Strategic approaches are rooted in thorough research, forecasting, and decision-making processes, allowing for more effective prioritization, risk management, and adaptability in changing environments. Resilience as a strategic approach involves the capacity of an organization, system, or industry to absorb shocks, adapt to disruptions, and continue functioning effectively under adverse conditions.

Innovation as a strategic approach focuses on developing new ideas, products, services, or processes that create value and provide competitive advantage. It drives progress by encouraging creativity, adopting new technologies, and transforming traditional practices into more efficient and sustainable ones (Kimani, 2022). As businesses adopt digital tools and online platforms, safeguarding sensitive information and maintaining operational integrity becomes essential. This study aimed to determine the influence of strategic approaches on performance of construction industry in Kiambu County, Kenya.

The construction industry in Kiambu County, Kenya, has experienced significant growth and transformation in recent years, driven by both urbanization and infrastructure development. As

one of the fastest-growing counties in Kenya, Kiambu has become an attractive destination for real estate investment, especially due to its proximity to Nairobi, the capital city (Kanyora & Okello, 2024). This strategic location has fueled demand for residential, commercial, and industrial properties, stimulating the construction sector. The county has seen rapid urban expansion, with towns like Thika, Ruiru, and Kiambu town itself undergoing substantial development in terms of housing estates, shopping malls, roads, and industrial parks (Gichohi, Iravo & Muchelule, 2024).

One of the key factors driving the construction boom in Kiambu County is the increasing population, both from local growth and migration from rural areas to urban centers. As more people settle in Kiambu, there has been a surge in demand for affordable housing, schools, healthcare facilities, and recreational spaces (Wawer & Omwenga, 2022). The county government, in collaboration with private investors, has taken proactive steps to meet these demands by implementing master plans and infrastructure projects that improve connectivity and amenities. Additionally, the Nairobi Metropolis Development Plan, which includes Kiambu County, has provided further impetus for infrastructure improvements, contributing to the overall growth of the construction industry in the region (Kimani, 2022).

Statement of the Problem

The construction industry in Kiambu County, Kenya, faces several challenges that impact the delivery of projects, cost efficiency, and the overall quality of work. These challenges are multifaceted and require targeted solutions to ensure sustainable growth in the sector (Wawer & Omwenga, 2022). Delays in project completion remain a significant challenge for the construction industry in Kiambu County, as they do for much of Kenya. A study conducted by the Kenya National Bureau of Statistics (KNBS) and the National Construction Authority (NCA) revealed that 50% of construction projects in Kenya experience delays, a trend that is mirrored in Kiambu. Specifically, the study showed that the average delay for construction projects is about 6-12 months beyond the originally planned completion date (Kimani, 2022). These delays are mainly caused by poor project management, labor shortages, logistical problems, and delays in obtaining necessary permits. According to the Institute of Quantity Surveyors of Kenya (IQSK), around 30% of projects in Kiambu County face delays due to permit-related issues, which significantly extend project timelines (Kanyanja & Muathe, 2023). Moreover, delays in material supply, often exacerbated by market fluctuations and global supply chain issues, are cited as another leading cause of time overruns. For example, during 2020 and 2021, Kiambu experienced a noticeable delay in the delivery of key construction materials like cement, which saw a delay of up to 45 days in some cases due to disruptions in both local and international supply chains (Kanyora & Okello, 2024).

Cost escalation is another major issue affecting the construction industry in Kiambu County. According to a report by the Kenya Builders and Contractors Association (KBCA), construction costs across the country increased by 25% from 2020 to 2022 (Gichohi, Iravo & Muchelule, 2024). In Kiambu, the situation is exacerbated by factors such as fluctuating material prices, high labor costs, and the rising cost of fuel, which affects the transportation of materials. For instance, the price of cement increased by approximately 10% between 2021 and 2022, with a 50kg bag costing upwards of KSh 800, compared to KSh 600 a year earlier. Similarly, the cost of steel has surged by 30% over the past three years, further driving up the overall expenses of construction projects (Wawer & Omwenga, 2022). In Kiambu, many contractors report facing cost overruns of up to 20% above initial estimates due to the unpredictability of material prices and labor shortages. A survey by the Kenya Institute of Quantity Surveyors (KIQS) revealed that nearly 40% of construction projects in the county experience cost escalations primarily due to the rising cost of

raw materials. Furthermore, fuel price increases directly affect transport costs, further contributing to the unpredictability in construction budgets. These cost hikes challenge developers to maintain profitability while trying to keep projects affordable for buyers (Kimani, 2022).

The issue of quality control in construction is a growing concern in Kiambu County, particularly with the fast-paced urbanization. A survey conducted by the National Construction Authority (NCA) in 2020 revealed that 35% of the construction projects in Kiambu faced significant quality-related challenges. These included the use of substandard materials, poor workmanship, and instances of non-compliance with established building codes (Kanyanja & Muathe, 2023). A specific example is the prevalence of structural defects in residential developments, where nearly 25% of houses constructed in the county in 2019 were reported to have issues such as cracks, weak foundations, and improper drainage systems. The NCA also reported that 28% of the buildings inspected in Kiambu between 2018 and 2020 failed to meet the required safety standards, with many contractors cutting corners to meet tight budgets and deadlines (Kanyora & Okello, 2024). Furthermore, the shortage of skilled labor has contributed to the poor quality of construction. According to the Kenya Building and Construction Workers Union (KBCWU), about 60% of the workforce in the construction sector lacks the necessary training and certification, which directly impacts the quality of workmanship on construction sites. This lack of quality control not only jeopardizes the safety of the buildings but also increases the likelihood of future repair and maintenance costs, reducing the overall value of properties (Gichohi, Iravo & Muchelule, 2024).

Strategic approaches in the construction industry are critical in determining the overall performance of projects, from their initiation to completion. Various studies have been conducted in different parts of the world on strategic approaches and construction project (Wawer & Omwenga, 2022). For instance, Kanyora and Okello (2024) assessed influence of strategic management practices on performance of construction firms. Gichohi, Iravo and Muchelule (2024) conducted a study on strategic approaches on the performance of road construction projects and Wawer and Omwenga (2022) researched on the influence of strategic management practices on performance of private construction firms. However, none of these studies focused on resilience, innovation, on performance of construction industry in Kiambu County, Kenya. To fill the highlighted gaps, the current study sought to determine the influence of strategic approaches (resilience, innovation,) on performance of construction industry in Kiambu County, Kenya.

General Objective

The general objective of the study is to determine the influence of strategic approaches on performance of construction industry in Kiambu County, Kenya

Specific Objectives

i. To determine the influence of resilience on performance of construction industry in Kiambu County, Kenya
ii. To determine the influence of innovation on performance of construction industry in Kiambu County, Kenya

Theoretical Review

Social Cognitive Theory

Social Cognitive Theory (SCT), developed by psychologist Albert Bandura (1963), is a psychological framework that explains how individuals acquire and perform new behaviors through the interaction of personal, behavioral, and environmental factors (Monstadt & Schmidt, 2020). The theory emphasizes the importance of social influences and cognitive processes in

learning, suggesting that people learn not only through direct experience but also by observing the actions of others, a process known as observational learning or modeling (Olubajo & Olusola, 2024). This concept positions individuals as active participants in their learning, rather than passive recipients of external stimuli. At the core of Social Cognitive Theory is the concept of reciprocal determinism, which refers to the dynamic and reciprocal interaction between personal factors (such as cognitive and emotional states), behavioral patterns (the actions individuals take), and environmental influences (such as social and physical surroundings) (Lagat *et al,* 2020). Bandura argued that each of these factors can influence and be influenced by the others, meaning that people can shape their own behaviors and the environment while also being shaped by them. For instance, a person might engage in a particular behavior because they see others being rewarded for it (environmental influence), while their ability to perform the behavior might be influenced by their self-confidence or skills (personal factors) (Kwamboka, 2020).

Another key component of Social Cognitive Theory is the concept of self-efficacy, which refers to an individual's belief in their ability to succeed in specific situations or tasks. High self-efficacy is linked to greater motivation and persistence, as individuals with strong beliefs in their abilities are more likely to take on challenges, persevere through difficulties, and achieve success (Kwamboka & Maina, 2022). Conversely, low self-efficacy can lead to avoidance of tasks and a lack of motivation. Bandura highlighted the importance of self-efficacy in various domains, including academic performance, health behavior change, and career development. In addition, SCT underscores the role of reinforcement and punishment in shaping behavior. While direct reinforcement can strengthen behaviors, observational learning allows individuals to adopt behaviors based on the rewards or punishments they observe others receive. This process can be either positive or negative, depending on whether the observed consequences are rewarding or punishing (Monstadt & Schmidt, 2020). This theory was used to determine the influence of resilience on performance of construction industry in Kiambu County, Kenya.

Diffusion of Innovations Theory

Innovation Diffusion Theory (IDT) is a framework that seeks to explain how new ideas, practices, and technologies spread within and between social systems. Developed by Rogers (1962), the theory emphasizes the process by which innovations are communicated over time among the members of a social group (Kazi, Aouad & Baldwin, 2020). At its core, IDT identifies several key elements that influence the adoption of innovations, including the characteristics of the innovation itself, the communication channels used to disseminate information, the social system in which the innovation is introduced, and the individual adopter's characteristics. One of the central components of IDT is the attributes of innovations, which are factors that determine how likely an innovation is to be adopted (Wyk, Kajimo-Shakantu & Opawole, 2021). Rogers identified five key attributes: relative advantage (the perceived benefits of the innovation compared to existing solutions), compatibility (how well the innovation aligns with existing values and practices), complexity (the perceived difficulty of using the innovation), trialability (the ease with which the innovation can be tested), and observability (the visibility of the innovation's results to others). These attributes play a critical role in shaping perceptions and, consequently, the rate of adoption among potential users (Sagini, Dianga & Mbiti, 2020).

Another significant aspect of IDT is the adoption process, which occurs in several stages: knowledge, persuasion, decision, implementation, and confirmation. During the knowledge stage, potential adopters become aware of the innovation. In the persuasion stage, they form opinions about the innovation, which can lead to a decision to adopt or reject it (Ngiri & Njagi, 2022). Implementation involves putting the innovation into practice, and confirmation is the stage where

adopters seek reinforcement of their decision, either strengthening their commitment or leading to discontinuance if the innovation does not meet expectations. IDT also emphasizes the importance of social networks and communication channels in the diffusion process (Muthigani, Diang'a & Githae, 2022). Innovations are often spread through interpersonal communication among peers, opinion leaders, and early adopters who influence others within their social networks. This social aspect highlights that the diffusion of innovations is not merely a linear process but rather a complex interplay of individual choices and social dynamics (Kazi, Aouad & Baldwin, 2020). This theory was used to determine the influence of innovation on performance of construction industry in Kiambu County, Kenya.

Conceptual Framework

A conceptual framework is a structured system of ideas and theories that guides research by defining key concepts, relationships, and variables. It serves as a foundation for understanding and interpreting the phenomena under study, helping researchers to outline their hypotheses and design their methodology (Miles, Huberman & Saldana 2019).

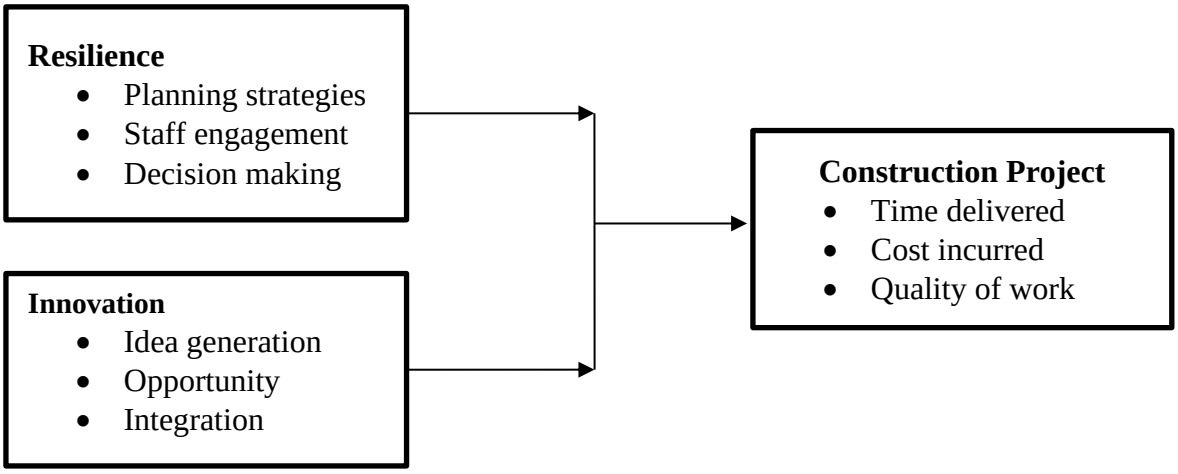

Figure 2. 1: Conceptual Framework

Resilience

Resilience refers to the ability to adapt to and recover from adversity, challenges, or difficult situations. It involves maintaining or quickly regaining mental, emotional, or physical strength in the face of stress, setbacks, or trauma (Monstadt & Schmidt, 2020). Resilient individuals or systems can bounce back from difficult experiences, learn from them, and continue functioning despite the difficulties they encounter. Planning strategies are the blueprint for achieving goals and overcoming challenges, outlining the specific steps and resources necessary to succeed. Effective planning involves setting clear objectives, defining priorities, and establishing a timeline to meet those goals (Olubajo & Olusola, 2024). A well-thought-out strategy considers potential obstacles and prepares for unforeseen circumstances by incorporating contingency plans. It helps guide decision-making, ensuring that actions are aligned with the long-term vision and that resources are used efficiently.

Staff engagement refers to the emotional commitment employees have toward their work, organization, and its goals. Engaged staff members are motivated, productive, and aligned with the company's mission and values (Kwamboka, 2020). Organizations that prioritize staff engagement foster a positive work culture, where employees feel valued, heard, and empowered

to contribute their ideas and skills. Decision-making is the process of selecting the best course of action from a range of alternatives, often considering both short-term and long-term consequences. Good decision-making requires gathering relevant information, evaluating risks, and weighing the potential outcomes of each option (Monstadt & Schmidt, 2020). It involves critical thinking, problem-solving, and sometimes collaboration, as decisions can have wide-reaching impacts. The process can be either intuitive or analytical, depending on the situation and the individual's experience (Olubajo & Olusola, 2024).

Innovation

Innovation refers to the process of creating new ideas, products, services, or methods that bring about positive change or improvement. It involves thinking creatively to solve problems, enhance existing processes, or address unmet needs in novel ways (Kazi, Aouad & Baldwin, 2020). Innovation is not limited to technological advancements; it can also encompass improvements in business practices, social solutions, and organizational strategies. Idea generation is the creative process of brainstorming, developing, and producing new concepts or solutions. It is the first step in innovation and problem-solving, where individuals or teams think outside the box to come up with ideas that can address challenges, improve existing processes, or meet specific needs (Sagini, Dianga & Mbiti, 2020). The process involves tapping into diverse perspectives, leveraging experiences, and utilizing techniques like brainstorming sessions, mind mapping, or research.

Opportunity refers to favorable circumstances or situations that can be leveraged for growth, success, or advancement. In business or personal development, recognizing and seizing opportunities is critical to achieving goals (Muthigani, Diang'a & Githae, 2022). Opportunities arise when new trends, unmet needs, technological advancements, or shifts in the market create a chance to innovate or improve. Identifying opportunities requires awareness, insight, and the ability to anticipate future demands. Integration is the process of combining different systems, ideas, or components into a unified and cohesive whole. In business, it can refer to the alignment of various functions, departments, or technologies to work together efficiently toward common goals. Integration is crucial in ensuring that resources, knowledge, and operations flow seamlessly within an organization, reducing duplication, improving efficiency, and fostering collaboration (Wyk, Kajimo-Shakantu & Opawole, 2021).

Empirical Review

Resilience and Construction Project

Monstadt and Schmidt (2020) conducted a study on the effect of urban resilience in the making? The governance of critical infrastructures in German cities. Over the last decade, the protection of urban infrastructures has become a focus in German security policies. The study found that drawing on qualitative research in selected German cities, we argue that the governance of critical infrastructures involves considerable challenges: it overarches different, often fragmented, policy domains and territories and institutionally unbundled utility (sub-) domains. The study concluded that in our article, the study have introduced the call for cultures of resilience by recent academic and policy debate on the governance of critical infrastructures.

Olubajo and Olusola (2024) conducted a study on the effect of examining the resilience of construction supply chains to disruptions triggered by Covid-19 in Abuja, Nigeria. This study aims at examining the resilience of construction supply chains to disruption triggered by Covid-19 in Abuja. The study adopted a survey approach, and data was obtained from structured questionnaires administered online to 90 stakeholders and 70 participants involved in different aspects of construction responded. The study found that contractual disputes and scarcity of materials ranked

highest as the effects of disruption and that construction practitioners adapted to the disruptions majorly by reducing the number of material requisitions or by integrating equipment to cater for the shortage of workers. The study concluded that planning and onsite assembly ranked highest as the two key construction activities with the highest levels of disruption

Lagat *et al* (2020) conducted a study on the effect of Strategies resilience towards Business Continuity for Construction Industry in Kenya during and after COVID-19 Pandemic. The onset of the novel COVID-19 pandemic declared by the World Health Organization (WHO) in 2019 has brought wide-ranging detrimental impacts on the construction industry. The study also found that post-COVID-19 recovery measures should include: risk assessment, preparation of action plans, accessibility to health insurance, and securing of inventory of materials. The study concluded that the present paper acts as a significant guide to the study of business continuity in the construction industry during and after the COVID-19 pandemic by uncovering the survival and recovery measures perceived by the construction contractors in Kenya as being effective in dealing with the pandemic.

Kwamboka (2020) conducted a study on the effect of strategic resilience and performance of small and medium enterprises in the construction industry in Nairobi city county, Kenya. Firm performance has become an enormously significant focus in today's business environment, especially by construction of small and mid-size enterprises. The target population comprised of 108 registered small and mid-size enterprises firms operating in Nairobi City County with 198 respondents comprising of site manager and project engineers. The study found that the effect of organizational learning, adaptive resilience, planned resilience and dynamic capabilities on performance of small and mid-size enterprises within Construction sector of the Nairobi City County, Kenya. However much these challenges cut across the SMEs, the study concludes that with the right measures and checks in place while implementing these components, an increased firm performance is guaranteed.

Kwamboka and Maina (2022) conducted a study on the effect of strategic resilience and performance of small and medium enterprises in the construction industry in Nairobi City County, Kenya. Firm performance has become an enormously significant focus in today's business environment, especially by construction small and mid-size enterprises (SMEs) management. The target population comprised of 108 registered small and mid-size enterprises firms operating in Nairobi City County with 198 respondents comprising of site manager and project engineers. The study utilized primary data collected from semi-structured type of questionnaire. The study found that however, despite the effort, 60% of the Nairobi City County SMEs in the construction sector fail to break even to make a profit, thus the need for this research aimed to investigate impact of strategic organizational resilience on how SME perform in the Construction Industry within Nairobi County, Kenya. The study concluded that before then, through the normality and multi-collinearity test conducted, the Shapiro-Wilk test p-values except for the planned resilience variable indicated that the data for organizational learning, adaptive capability, dynamic capability, and firm performance do not significantly depart from normality.

Innovation and Construction Project

Kazi, Aouad and Baldwin (2020) conducted a study on the effect of strategic roadmaps for construction innovation: assessing the state of research in Canada. The paper describes the research inventory initiative and briefly summarizes the resulting picture of the construction research landscape in Canada. The results are expected to provide an underlying planning, coordination, and dissemination foundation to improve the ability for the research community to contribute to innovation in the Canadian construction industry. The study concluded that the core of the strategic

planning process in Canadian construction process technologies is to understand what is required to make innovation happen at a quicker pace

Wyk, Kajimo-Shakantu and Opawole (2021) conducted a study on the effect of adoption of innovative technologies in the South African construction industry. The South African construction industry appears to be lagging behind other industries in the country in terms of implementation and adoption of innovative technologies. A survey was undertaken using a questionnaire, administered to construction professionals primarily in project management, quantity surveying and architectural firms. The key findings show that there are some innovative technologies such as building information modeling, 3-dimensional mapping, drones, 3-dimensional printing and virtual reality that have been deployed. The study concluded that the study indicates that organizations within the South African construction industry are aware of innovation technologies in the construction market but have not yet fully understood what they involve and therefore do not implement them at a significant level

Sagini, Dianga and Mbiti (2020) conducted a study on the effect of investigating factors that influence the rate of adoption of innovative construction technologies in Kenya. The construction industry is widely perceived to lag behind manufacturing and other sectors in innovation and its adoption. The results indicated that attributes of innovation, procurement systems, regulations and developer and Architect influence were major determinant factors in the adoption process. The study concluded that there is evidence of innovation and adoption of innovative construction technologies in the Kenyan Context

Ngiri and Njagi (2022) conducted a study on the effect of strategic innovation and communication on the performance of building construction companies in Nairobi Kenya. The study sought to examine the influence of strategic innovation and strategic communication on the performance of building construction companies in Nairobi Kenya. The study found that strategic innovation and strategic communication had a positive and significant influence with the performance of building construction companies in Nairobi Kenya. The study concluded that strategic innovation structures efforts around the organizational goals and ensures that all departments of the organization support them

Muthigani, Diang'a and Githae (2022) conducted a study on the effect of assessment of the outcomes of innovative construction technologies in slum upgrading: A case of Mathare Valley, Nairobi. The aim of this paper was to assess the outcomes of innovative construction in housing in slum upgrading in Mathare valley. Results indicated that the upgrade improved the houses structural envelope of walls, floors and roofs. The respondent’s perception of the scheme in terms of quality and acceptability was significant though deterioration of the structural envelope with time was evident. The study concluded that the innovative construction adoption method should not focus on the demolition of the already existing structure but rather improvement of the existing structures.

RESEARCH METHODOLOGY

Research Design

This study adopted a descriptive research design. This is a scientific method of investigation in which data is collected, processed, analyzed and presented in order to describe the current conditions, terms or relationships concerning a certain field (Mugenda, 2018). A scientific method involves observation and description of behavior of subject without influencing it in any way. The

choice of this research design was influenced by the fact that it caters for qualitative and quantitative data (Cooper & Schindler, 2019).

Target Population

This study was conducted in the construction industry in Kiambu County, Kenya. According to National construction authority (2024) there are 124 on-going projects in the construction industry in Kiambu County, Kenya. The study targeted project managers and contractors in each project hence the total population was 248 respondents.

Sample Size and Sampling Techniques

In this study, due to the small size of the study population, the census sampling approach was used. Census sampling is a technique of statistical sampling that involves collecting data from every member of a population (Särndal, Swensson & Wretman, 2019). Therefore, census approach was appropriate for selecting the sample for this study, and the sample size for the study was 248 respondents.

Data Collection Instruments

This research used a questionnaire to collect primary data. According to Patton *et. al (*2016), a questionnaire is appropriate in gathering data and measuring it against a particular point of view. It provides a standardized tool for data collection. Structured questions were used to collect primary data from the field. Questionnaires were preferred because they are effective data collection instruments that allow respondents to give much of their opinions pertaining to the research problem (Dempsey, 2019). According to Kothari (2018), the information obtained from questionnaires is free from bias and researchers' influence and thus accurate and valid data was gathered. The preference for the questionnaire is based on the premise that it gives respondents freedom to express their views or opinions more objectively.

According to Krishnaswamy, Sivakumar and Mathirajan (2019), questionnaire method of data collection is good because the standardized and impersonal format of a questionnaire has uniformity and help in getting data objectively. In using questionnaires respondents' anonymity and confidentiality is assured and they are able to complete them when it is convenient and in their own time (De-Vaus, 2016)

Pilot Study

A pilot test was conducted to assess the questionnaire's validity and reliability of the data that was collected. According to Copper and Schindler (2019), a pilot test is conducted to detect weaknesses in the design and instrumentation and provide a proxy data for selection of probability sample. According to Leedy and Ormrod (2019), a pilot study is an excellent way to determine the feasibility of the study.

The subjects participating in the pilot study were not included in the final study to avoid survey fatigue. Twenty five questionnaires were piloted that represented 10% of the target population. The pilot group was selected from Nairobi County because they share similar characteristics with its neighbor, Kiambu County.

Data Analysis and Presentation

The study collected quantitative data from close-ended questions. The analysis involved both the descriptive and inferential statistics using the Statistical Package for Social Sciences (SPSS) version 24. The collected data was further analyzed using multi linear regression to determine the

relationship between the dependent and independent variables. The data presentation was done by use of tables and figures.

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

Descriptive Statistics Analysis

Resilience and Construction Project

The first specific objective of the study was to determine the influence of resilience on performance of construction industry in Kiambu County, Kenya. The respondents were requested to indicate their level of agreement on statements relating to resilience and performance of construction industry in Kiambu County, Kenya. The results were as presented in Table 1.

From the results, the respondents agreed that risk assessments are regularly conducted and integrated into strategic planning (M=3.973, SD= 0.981). In addition, the respondents agreed that their planning processes are flexible enough to adapt to sudden changes or crises (M=3.966, SD= 0.850). Further, the respondents agreed that staff are well-informed and supported during periods of organizational change (M=3.931, SD= 0.914).

The respondents also agreed that the organization promotes a culture of resilience and continuous learning among employees (M=3.896, SD= 0.947). In addition, the respondents agreed that leaders make timely and effective decisions during high-pressure situations (M=3.889, SD= 0.856). Further, respondents agreed that the organization uses data and evidence to support resilient decision-making under stress (M=3.786, SD= 0.876).

Table 1: Resilience and Construction Project

	Mean	**Std. Deviation**
Risk assessments are regularly conducted and integrated into strategic planning.	3.973	0.981
Our planning processes are flexible enough to adapt to sudden changes or crises.	3.966	0.850
Staff are well-informed and supported during periods of organizational change.	3.931	0.914
The organization promotes a culture of resilience and continuous learning among employees	3.896	0.947
Leaders make timely and effective decisions during high-pressure situations.	3.889	0.856
The organization uses data and evidence to support resilient decision-making under stress.	3.786	0.876
Aggregate	**3.907**	**0.904**

Innovation and Construction Project

The second specific objective of the study was to determine the influence of innovation on performance of construction industry in Kiambu County, Kenya. The respondents were requested to indicate their level of agreement on various statements relating to innovation and performance of construction industry in Kiambu County, Kenya. The results were as presented in Table 2.

From the results, the respondents agreed that employees are encouraged to share new and creative ideas regularly (M=3.840, SD=0.861). In addition, the respondents agreed that there are structured processes in place to capture and evaluate innovative ideas (M=3.834, SD=0.783). Further, the

respondents agreed that the organization actively seeks opportunities to apply innovative solutions (M=3.788, SD=0.866).

From the results, the respondents agreed that staff are provided with time and resources to explore innovative projects (M=3.772, SD=0.753). Further, the respondents agreed that innovative ideas are effectively integrated into existing processes and systems (M=3.749, SD=0.896). The respondents also agreed that the organization supports the implementation of new ideas through proper planning and resources (M=3.723, SD=0.645).

Table 2: Innovation and Construction Project

	Mean	Std. Deviation
Employees are encouraged to share new and creative ideas regularly.	3.840	0.861
There are structured processes in place to capture and evaluate innovative ideas.	3.834	0.783
The organization actively seeks opportunities to apply innovative solutions.	3.788	0.866
Staff are provided with time and resources to explore innovative projects.	3.772	0.753
Innovative ideas are effectively integrated into existing processes and systems.	3.749	0.896
The organization supports the implementation of new ideas through proper planning and resources.	3.723	0.645
Aggregate	**3.784**	**0.801**

Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (resilience and innovation) and the dependent variable (performance of construction industry in Kiambu County, Kenya). Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients.

Table 3: Correlation Coefficients

		Construction Project	Resilience	Innovation
Construction Project	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	220		
Resilience	Pearson Correlation	.825**	1	
	Sig. (2-tailed)	.003		
	N	220	220	
Innovation	Pearson Correlation	.834**	.289	1
	Sig. (2-tailed)	.002	.050	
	N	220	220	220

From the results, there was a very strong relationship between resilience and performance of construction industry in Kiambu County, Kenya (r = 0.825, p value =0.003). The relationship was significant since the p value 0.003 was less than 0.05 (significant level). The findings are in line with the findings of Monstadt and Schmidt (2020) who indicated that there is a very strong relationship between resilience and construction project.

Moreover, the results revealed that there is a very strong relationship between innovation and performance of construction industry in Kiambu County, Kenya (r = 0.834, p value =0.002). The relationship was significant since the p value 0.002 was less than 0.05 (significant level). The findings conform to the findings of Sagini, Dianga and Mbiti (2020) that there is a very strong relationship between innovation and construction project.

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (resilience and innovation) and the dependent variable (performance of construction industry in Kiambu County, Kenya)

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.852	.726	.727	.10120

a. Predictors: (Constant), resilience and innovation

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.726. This implied that 72.6% of the variation in the dependent variable (performance of construction industry in Kiambu County, Kenya) could be explained by independent variables (resilience and innovation).

Table 5: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110.187	2	55.094	798.464	.000[b]
	Residual	8.099	117	.069		
	Total	118.286	119			

a. Dependent Variable: performance of construction industry in Kiambu County, Kenya
b. Predictors: (Constant), resilience and innovation

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 798.464 while the F critical was 3.074. The p value was 0.000. Since the F-calculated was greater than the F-critical and the p value 0.000 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of resilience and innovation on performance of construction industry in Kiambu County, Kenya.

Table 6: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	0.354	0.096		3.688	0.000
resilience	0.378	0.099	0.379	3.818	0.001
innovation	0.385	0.099	0.384	3.889	0.000

The regression model was as follows:

$$\mathbf{Y = 0.354+0.378X_1 +0.385X_2 + \varepsilon}$$

According to the results, resilience has a significant effect on performance of construction industry in Kiambu County, Kenya (β_1=0.378, p value= 0.001). The relationship was considered significant

since the p value 0.001 was less than the significant level of 0.05. The findings are in line with the findings of Monstadt and Schmidt (2020) who indicated that there is a very strong relationship between resilience and construction project.

The results also revealed that innovation has a significant effect on performance of construction industry in Kiambu County, Kenya (β1=0.385, p value= 0.000). The relationship was considered significant since the p value 0.000 was less than the significant level of 0.05. The findings are in line with the findings of Sagini, Dianga and Mbiti (2020) who indicated that there is a very strong relationship between innovation and construction project.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study concludes that resilience has a positive and significant effect on performance of construction industry in Kiambu County, Kenya. Findings revealed that planning strategies, staff engagement and decision making influences performance of construction industry in Kiambu County, Kenya.

In addition, the study concludes that innovation has a positive and significant effect on performance of construction industry in Kiambu County, Kenya. Findings revealed that idea generation, opportunity and integration influences performance of construction industry in Kiambu County, Kenya.

Recommendations

The study recommends that the management of construction industry in Kenya should prioritize building organizational resilience through strategic planning and risk management. By developing a robust framework that anticipates potential challenges, construction companies can mitigate risks and maintain steady performance even in volatile conditions

In addition, the study recommends that the management of construction industry in Kenya should invest in innovative building materials and construction techniques to enhance overall performance. Embracing modern, sustainable materials can not only reduce construction costs and time but also improve the durability and environmental impact of buildings.

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