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SUSTAINABLE PROCUREMENT PRACTICES AND COST PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN KENYA

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ABSTRACT

In light of the rising global importance of sustainable procurement implementation for contributing to sustainable development goals, the purpose of this study was to examine the influence of sustainable procurement practices on cost performance of road construction projects in Kenya. The study employed the positivist research philosophy and the quantitative non-experimental research methodology. The study utilized the correlational research design to test noncausal relationship between the study variables without the researcher controlling any of them. The target population consisted of 47 regional directors, 47 supply chain officers and 94 prequalified contractors in charge of road construction projects under the Kenya Rural Roads Authority in Kenya. The proportionate stratified random sampling technique was used to select a sample size of 32 regional directors, 32 supply chain officers and 64 prequalified contractors in charge of road construction projects in Kenya. A self-administered structured survey questionnaire was used to collect primary data. A pilot study was conducted to test the validity and reliability of the constructed survey questionnaire. With the help of the 3 research assistants, the researcher hand delivered the survey questionnaire to the random sample using the drop and pick method. A cross-sectional survey-based approach was used. The collected data was coded, edited, and entered into the Statistical Package for Social Sciences (SPSS) version 26 to create a data sheet that was used for statistical analysis. Descriptive statistics and inferential statistics were used for data analysis. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that green purchasing and sustainable supplier management practices had positive and significant relationship with cost performance of road construction projects in Kenya. The multiple regression results indicated that green purchasing and sustainable supplier management practices had positive and significant influence on cost performance of road construction projects in Kenya. The study recommends that sustainable procurement should be integrated as part of construction project procurement process to foster performance of road construction projects. Future researchers should examine the moderating influence of project complexity on the relationship between sustainable procurement practices and performance of construction projects in other regions or sectors.

Key words: *Cost performance, Green Purchasing, Sustainable supplier management, Sustainable procurement practices, Kenya*

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INTRODUCTION

The construction industry is the pillar of success of modern countries. The construction industry plays an essential role in the development of any country (Nguyen & Macchion, 2022; Kabutiei, Nyang'au, & Muchelule, 2022). However, the failure of many construction projects in meeting deadlines, cost and quality targets is continuously on the rise (ALSaadi & Norhayatizakuan, 2021). Despite the government's continued investment in road construction, the road construction delays have had a negative influence on Kenya's social and economic gains that would have accrued if the projects had been completed on time (Kipchirchir, 2022). The successful management of a construction project is the most desirable for all organizations and stakeholders (Shafiuddin, Durrani, Al-Bulushi, Al-Farsi, & Al-Hosni, 2022). However, the construction delays have become an integral part of a project's lifecycle (Shayan, Pyung Kim, & Tam, 2022). The construction industry continues to deliver its products over budget, beyond original estimated construction period and at times with poor quality (Dindi, 2022).

The project implementation team always aims for successful outcome of construction projects (Oke, Arowoiya, & Akomolafe, 2022). However, the dynamic nature of the construction projects and the involvement of large number of stakeholders exposes the projects to a variety of known and unknown risks (Sami Ur Rehman, Thaheem, Nasir, & Khan, 2022). The construction industry entails high levels of risk, but often this risk is not dealt with adequately, resulting in poor project performance, which is reflected in frequent cost and time overruns, as well as poor quality of work (Khisa & Mutiso, 2022). The construction industry has complexity in its nature, because it contains a large number of parties such as clients, contractors, consultants, stakeholders, shareholders, and regulators (Gitonga, Muchelule, & Nyang'au, 2022).

Globally, sustainable public procurement is among the key avenues for realizing the three pillars of sustainable development (Kumar, 2022b). Sustainable procurement involves procurement decisions to meet an enterprise's requirement for goods or services, while minimizing the influence on environment (Stefanovic, 2022). However, little has been written about how the construction industry could turn the challenges of sustainable procurement into opportunities that promotes procurement practices in accordance with national policies and priorities (Opoku *et al.*, 2022). Sustainable procurement management as a potential solution takes the environmental consequences of procurement decisions into account and integrates sustainable practices into project procurement to bring positive environmental outcomes (Ershadi, Jefferies, Davis, & Mojtahedi, 2021). Developing sustainable procurement is critical to achieving better project performance (Al Fath, Herwindiaty, Wibowo, & Sari, 2024). However, effective implementation and committed practice of sustainable procurement remain a significant challenge for many organizations across the globe (Etse *et al.*, 2023).

Statement of the Problem

Despite its scale and achievements, the construction industry has struggled with limited productivity gains and inefficiencies, including frequent cost and time overruns and a considerable environmental impact due to high resource and energy consumption (Rodriguez Trejo, Najafi, & Rahimian, 2024; Sheikhkhoshkar, Bril El-Haouzi, Aubry, & Hamzeh, 2023). The construction industry still continues to experience significant cost overruns, schedule delays and poor-quality output, resulting in poor time, cost and quality performance (Khisa & Mutiso, 2022). Within the context of construction projects, the poor performance of project costs and up to 86% of international construction projects face cost overruns, and 30% to 40% encounter inferior cost performance and overruns globally (Elserougy, Khodeir, & Fathy, 2024). Although achieving project completion within the estimated cost is fundamental criteria for success of any project, most of projects face cost overrun problem with an average overrun in the

range of 5% to 10% of the total project cost (Najafi, Sheikhkhoshkar, & Rahimian, 2024). In Kenya, the majority of the projects are not completed within allocated cost (Mugweru & Muchelule, 2022).

Kenya's construction industry is anticipated to expand at an average annual rate of 5.9% between 2024 and 2027 (Werna & Ofori, 2023). However, the failure of many construction projects in meeting cost targets is continuously on the rise and there are signs of accentuating year after year suffering significant financial losses of construction works in Kenya. About 55 percent of the road construction projects in the country face a variety of difficulties, that prevent them from being completed on time, incurring cost overruns, or failing to meet the required quality requirements (Kabiti & Kikwatha, 2022). In spite of the government's continued investment in road construction, the road construction projects have been experiencing poor project performance in form of high cost (Gitonga *et al.*, 2022; Kabutiei *et al.*, 2022).

Despite their crucial contribution to the economic growth and prosperity of nations around the world, the rural road projects in developing nations still experience challenges with cost overruns ranging between 5.8% to 14.97% (Kitungo & Musembi, 2024). The issue of changes in project cost is a major challenge in both developed and developing countries (Mugweru & Muchelule, 2022). Effective cost management practices are essential for successful integrated project delivery and elevated cost management practices (Rachmawati *et al.*, 2024). However, poor cost performance in projects has become routine, and research has focused on understanding the factors contributing to this issue (Zhou *et al.*, 2023). Sustainable procurement practices and project performance has been widely discussed in the literature from various perspectives (Eretan, 2024; Herwindiaty *et al.*, 2024; Mudashir, Zadawa, & Mohammed, 2024). However, there has been a plethora of research on the performance of cost in construction projects (Salih & El-adaway, 2024). The majority of these studies have focused on developed countries with a paucity of studies within the developing countries (Kumar, 2022a; Msakwa, 2023). The existing empirical literature has provided mixed findings or inconclusive results. Therefore, the general business problem lies in understanding the influence of sustainable procurement practices on cost performance of road construction projects in Kenya.

Objectives of the Study

This quantitative non-experimental correlational study was guided by a general and two specific objectives. The general objective of the study was to examine the influence of sustainable procurement practices on the cost performance of road construction projects in Kenya. The specific objectives were;

- To determine the influence of green purchasing on cost performance of road construction projects in Kenya.
- To assess the influence of sustainable supplier management on cost performance of road construction projects in Kenya.

In this study, two null hypotheses were tested.

- H_{01}: Green purchasing has no significant influence on cost performance of road construction projects in Kenya.
- H_{02}: Sustainable supplier management has no significant influence on cost performance of road construction projects in Kenya.

LITERATURE REVIEW

Theoretical Framework

Theoretical framework is the lens through which the researcher uses to connect the literature with the study results and methodology (Bingham, Mitchell, & Carter, 2024). The theoretical framework was anchored on the resource-based view theory, dynamic capability theory of constraints and the institutional theory.

Resource Based Theory

The resource-based (RBT) theory (Barney, 1991; Penrose, 1959; Wernerfelt, 1995) provides an explanation as to why some organizations are

performing better and how an organization can perform better (Wu, Yan, & Umair, 2023). The RBT theory posits that firms' competitiveness even in the same industry varies based on a firm's resources and capabilities (Zulkiffli, Zaidi, Padlee, & Sukri, 2022). The RBT theory provides the underpinning theoretical framework that explains the influence of sustainable procurement practices on cost performance of road construction projects in Kenya. Through the lens of the RBT theory, Nangpiire, Gyebi, and Nasse (2024) examined the predictive relationship between sustainable procurement practices and the performance of small and medium enterprises in Ghana. The RBT theory holds that firms can earn sustainable super normal returns if they have superior resources, which are protected by some form of isolating mechanism preventing their diffusion through industry (Teece, 2023a).

The RBT theory suggests that the VRIN resources are difficult to monetize directly through contracting arrangements that would allow other firms to utilize the resources in exchange for service fees (Vieira, Jaramillo, Agnihotri, & Molina, 2023). The RBT theory postulates that the VIRN framework is used to help companies identify certain resources and capabilities that can provide them with a sustained competitive advantage (Alvarez, Newman, Barney, & Plomaritis, 2023). Therefore, the RBT theory is the underpinning theory for the research model to explain the influence of green purchasing and ethical procurement practices on cost performance of road construction projects in Kenya.

Dynamic CapabilitY Theory

The dynamic capability (DC) theory (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1990) views dynamic capability as the firm's ability to integrate, build and reconfigure internal and external competencies to address the rapidly changing environments (Martins, 2023). The dynamic capabilities are the firm's ability to integrate, build, and reconfigure internal and external resources/competences to address and shape rapidly changing business environments (Muneeb, Ahmad, Abu Bakar, & Tehseen, 2023). The DC theory provides the relevant theoretical framework that explains the influence of sustainable procurement practices on cost performance of rural construction projects in Kenya. The DC theory (Teece & Pisano, 2003; Teece, Pisano, & Shuen, 1997) suggests that firms should develop the ability to build, integrate, and reconfigure resources and competencies to achieve competitive advantages (Teece, 2023).

The DC theory is considered an extension for RBV theory to deal with the changes occurred in the environment due to digital technologies (Teece, 2023). Therefore, the DC theory is a relevant theoretical framework that can be used to explain the influence of green purchasing, sustainable supplier management, electronic procurement and ethical procurement practices on performance of road construction projects in Kenya. The DC theory addresses the particular shortcomings of the RBV theory as a means for firms to evolve in changing environments and maintain a competitive edge (Hällerstrand, Reim, & Malmström, 2023). The DC theory is concerned with how firms can sustain and enhance their competitive advantage, notably when facing changing environments (Solem, Fredriksen, & Sørebø, 2023).

Institutional Theory

The institutional theory (Cooper, Ezzamel, & Willmott, 2008; Lawrence & Suddaby, 2006) emphasizes how organizational practices that evolve within specific areas of social life, or institutional fields, gradually come to resemble each other as organizations seek to legitimize themselves to their surrounding environments and how this imbues such fields with a high degree of stability (Eitrem, Meidell, & Modell, 2024). The institutional theory provides the relevant theoretical framework that explains the influence of sustainable procurement practices on cost performance of construction projects in Kenya. In the context of sustainable procurement practices, the institutional theory suggests that when senior leaders actively

promote and endorse sustainable practices, they signal the significance of sustainability to the organization and external stakeholders, which in turn translates to superior performance (Ma *et al.*, 2021). The institutional theory (Butler, 2011) has been applied ever since 1930 (Bansal & Clelland, 2017) in understanding the response of the firm to increasing pressures for management of the environment (Adom & Ackom, 2024). The institutional theory argues that an organization's institutional environment strongly influences the adoption and development of formal structures in the organization (Eitrem, Meidell, & Modell, 2024; Forster, Lyons, Caldwell, Davies, & Sharifi, 2024).

The institutional theory identifies three types of institutional environment forces namely normative, coercive, and, mimetic forces that can influence an organization's practices (Lin & Yeh, 2024). The institutional theory suggests that institutional pressure has led firms to adopt sustainable procurement practices (Eitrem *et al.*, 2024). The institutional theory provides the relevant theoretical framework that explains the influence of green purchasing and ethical procurement practices on cost performance of road construction projects in Kenya. Through the lens of the institutional theory, Nangpiire *et al.* (2024) examined the predictive relationship between sustainable procurement practices and the performance of small and medium enterprises in Ghana. Drawing on institutional theory, Nawaz and Guribie (2024) analyzed the influence the adoption of institutional isomorphism on the adoption of social procurement in the Chinese construction industry. Due to increased public awareness of organizational failure and environmental demands, institutional theory recommends that companies can only gain legitimacy through reduction of their environmental influence and being socially responsible (Glynn & D'aunno, 2023).

Conceptual Framework

The conceptual framework illustrates that project cost performance is conceptualized as the dependent variable. However, the conceptual framework depicts that green purchasing and sustainable supplier management are conceptualized as the independent variables. Figure 1 presents the conceptual framework.

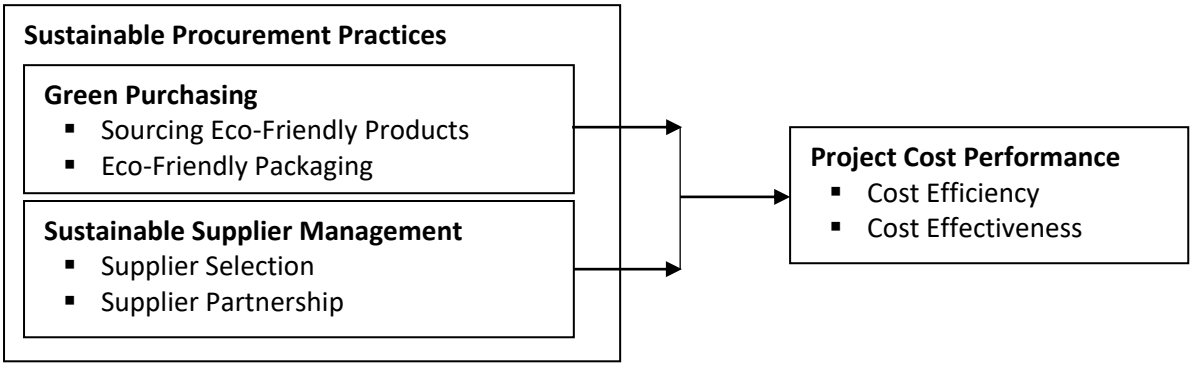

Figure 1: Conceptual Framework

Review of Literature on Variables

This section presents a review of the literature relevant to variables of the research.

Green Purchasing

Green purchasing involves procuring goods and services in a manner that integrates fiscal responsibility, social equity and environmental stewardship (Yee, Shaharudin, Ma, Zailani, & Kanapathy, 2021). It is the extent to which companies pay attention to the environmental influence when they do activities to buy company raw materials, company auxiliaries, and components needed to do production (Slastanova, Palus, Sulek, Parobek, & Slastanova, 2021). Green purchasing is one of the green supply chain

management practices that can be applied in the textile industry (Kubiczek *et al.*, 2024). The green purchasing behavior involves the purchasing environmentally friendly products that can be recycled, which is advantageous to the natural environment and the acquisition of goods that are made from recycled content which are environmentally preferable products and services (Hazaea *et al.*, 2022).

For organizations, green purchasing is the primary strategy of enterprises through which they can improve efficiency and reduce waste, along with the possibility of enhancing competitiveness (Lee & Hussain, 2024). Green purchasing capabilities influence practices and sustainability performance (Yee *et al.*, 2021). In recent years, discussions on green purchasing have increased. However, most studies were concentrated in developed countries, with limited studies conducted in developing countries (Hazaea *et al.*, 2022).

Sustainable supplier management

Strategic supplier management is an important success factor in any modern corporate culture (Siddiquee, Shaha, & Hasin, 2024). It involves incorporating environmental, social, and ethical considerations throughout the entirety of a firm's procurement (Lou, You, & Xu, 2024). Sustainable supplier management is the development of a commitment over an extended period of time to work together for the mutual benefit of the parties involved with the intention of sharing relevant information, risks and rewards from the partnership (Yazdani, Ariza-Montes, Arjona-Fuentes, & Radic, 2024). It includes the management of all measures for controlling, planning and regulating the supplier base (Bai *et al.*, 2024).

The sustainable supplier management processes necessitate the integration of multiple criteria, efficient supplier coordination, and adaptability to evolving challenges (Li, Tsang, Wu, & Lee, 2024). However, conventional supplier management practices primarily rely on expert judgment, focus on the present situation, and lack a robust decision validation mechanism, leading to a limited capability to constitute proactive managerial decision-making under uncertainty (Govindan & Jha, 2024). Sustainable supplier management bridges the gap between expertise and knowledge, helps in the reduction of costs, creates more business opportunities and may create a tax benefit for the firms that agree to partner (Zhao, Ji, & Ji, 2024). The goal of sustainable supplier management is to establish solid, long-term partnerships with the most efficient suppliers in order to secure your own competitiveness (Govindan & Jha, 2024).

Project Cost Performance

Project cost performance refers to the evaluation and measurement of how well a project is performing in terms of its cost objectives (Rachmawati, Mudjahidin, & Dewi Widowati, 2024). Extant literature posits that project cost performance involves assessing the actual costs incurred during the project against the planned or budgeted costs (Zhou, Wang, Gosling, & Naim, 2023). However, completing road construction projects within the budget and time has been a problem (Gusbian & Amin, 2024). In construction projects, cost deviation occurs which could either be positive or negative and if it is positive, it indicates the cost overrun (Al-Nahhas, Hadidi, Islam, Skitmore, & Abunada, 2024).

Generally, time, cost and quality are the performance areas which most of the researchers have acknowledged (Ingle & Mahesh, 2022). Project performance is the overall measurement of whether a project has met objectives and requirements of scope, cost, and schedule (Kerzner, 2022). In contrast, project cost performance represents to the evaluation and measurement of how well a project is performing in terms of its cost objectives (Rachmawati *et al.*, 2024). However, one of the major problems which are becoming very significant and is booming worldwide in the construction industry is the problem of cost overrun (Sharma, Gupta, & Khitoliya, 2021). In recent years, cost overrun in construction projects has become a

major challenge in the completion of road construction projects. For both developed and developing countries, cost overrun is a common problem in the construction industry (Musarat *et al.*, 2021). The cost overrun of large-scale infrastructure projects that cost more than USD 35 million to complete is a worldwide issue (Harris, Marleno, & Oetomo, 2024). Therefore, a successful project has to remain within budget (Safaeian *et al.*, 2022).

Performance measurement, including accurate time and cost forecasts, is crucial for project control and management, especially during the early stages of construction (Salih & El-adaway, 2024). Effective cost management practices, such as activity-based costing (ABC), earned value management (EVM), and web-based management systems supported by building information modelling (BIM), are essential for successful integrated project delivery (IPD) and elevated cost management practices (Rachmawati *et al.*, 2024). However, poor cost performance in projects has become routine, and research has focused on understanding the factors contributing to this issue (Zhou *et al.*, 2023).

Empirical Review

This section presents the empirical review.

Green purchasing and Project Performance

In the context of Türkiye, Balin and Sari (2023) examined the effect of green purchasing practices on financial performance under the mediating role of environmental performance. The findings indicated that green purchasing practices, in general, make a positive contribution to both the environmental performance and financial performance of companies in Türkiye. However, the results showed that the two green purchasing practices sub activities, green supplier development and green supplier evaluation, do not have a significant effect on environmental performance, contrary to our expectation. The findings indicated that environmental performance had a significant increase in financial performance and plays a partial mediating role in the effect of green purchasing practices on financial performance.

In the Nigerian context, Bolaji, Abdul Rahim, and Omar (2024) examined the influence of green practices on environmental performance in the SME Sector. The results indicated that the relationship between the external green supply chain and environmental performance was the only direct hypothesis not supported by this investigation. Specifically, the findings showed that a significant relationship exists between customer integration, green purchasing, and environmental performance.

Wungkana, Siagian, and Tarigan (2023) examined the influence of eco-design, green information systems, green manufacturing, and green purchasing on manufacturing performance. The results showed that the implementation of eco-design has an influence on green purchasing and green manufacturing. The findings suggested that eco-design and green information systems implemented by the company can improve manufacturing performance by producing adequate overall product quality, and the number of products produced varies according to market demand. The research revealed that green manufacturing and green purchasing can influence manufacturing performance.

Nugroho, Tarigan, and Siagian. (2024) examined the influence of green purchasing on operational performance. The results indicated that green purchasing practices had a positive and significant influence on operational performance. The findings indicated that green purchasing practices had had a partial significant mediating influence in the relationship between top management commitment and operational performance. The findings indicated that top management commitment contributes more influence on the operational performance through the mediating role of the green purchasing and the ISO1400 implementation than its direct influence.

In the Indonesian context, Kozuch, Langen, von Deimling, and Eßig (2023) examined the link between green procurement practices and performance employing meta-analysis. The findings demonstrated that the introduction of green

procurement practices has a positive effect in each of the areas. The results indicated that the introduction of green procurement practices ultimately on organizations' overall economic performance.

Sustainable supplier management and Project Performance

In the Tanzanian context, Changalima, Mchopa, and Ismail (2022) examined the relationship between supplier development and procurement performance in the public sector. The results indicated that supplier development had a positive and significant relationship with procurement performance in public sector. The findings indicated that contract management difficulty negatively and significantly moderates the relationship between supplier development and procurement performance.

Changalima, Ismail, and Mchopa (2023) examined the effects of supplier selection and supplier monitoring on public procurement efficiency in Tanzania. The results indicated that supplier selection and supplier monitoring had positive and significant relationship with procurement performance in public sector. The findings indicated that supplier selection and supplier monitoring had a positive and significant effect on procurement performance in public sector.

Changalima, Mchopa, and Ismail (2023) examined the effect of supplier monitoring on procurement performance in the public sector in Tanzania. The results indicated that supplier monitoring had a positive and significant relationship with procurement performance in public sector. The findings indicated that contract management difficulty negatively and significantly moderates the relationship between supplier monitoring and procurement performance.

METHODOLOGY

This section presents the research methodology.

Research Philosophy: The research was guided by the positivist research philosophy which regards the world as made up of observable and measurable facts and assumes that there is an objective reality out there. The positivist research philosophy regards the world as made up of observable and measurable facts and assumes that there is an objective reality out there (Ma & Xie, 2023).

Research Design: The research employed the correlational cross-sectional survey research design to examine the non-causal relationship between study variables. The design was appropriate for collecting data once from many individuals at a single point in time to test statistical relationships between two or more variables without the researcher controlling or manipulating any of them (Aryuwat *et al.*, 2024).

Target Population: The target population consisted of 188 project implementation team comprising of 47 regional directors, 47 supply chain officers and 94 prequalified contractors in charge of road construction projects under the Kenya Rural Roads Authority in Kenya. The target population was as per the Kenya Rural Roads Authority (KeRRA, 2023)'s database as 31st December, 2023. Table 1 presents the target population.

Table 1: Target Population

Strata	Frequency	Percentage
Regional Directors	47	25%
Supply Chain Officers	47	25%
Prequalified Contractors in Every County	94	50%
Total	**188**	**100%**

Source: Kenya Rural Roads Authority (KeRRA, 2023)

Sampling Frame: The sampling frame for this study consisted of the list of 188 project implementation team comprising of 47 regional directors, 47 supply chain officers and 94 prequalified contractors in charge of road construction projects under the Kenya Rural Roads Authority in Kenya. The sampling was as per the Kenya Rural Roads Authority (KeRRA, 2023)'s database as 31st December, 2023.

Sample Size and Sampling Techniques: This section presents the sample size and sampling techniques.

Sample Size: The Yamane (1967) formula was used to calculate sample size at 95% confidence level and 5% significance level to ensure that the sample size was truly reflective of the target population.

$$n = \frac{\mathrm{N}}{1 + \mathrm{N}e^2)}$$

Where:

n = Sample Size;

N = Target Population;

e = Margin of Error = 0.05.

With a target population of 188 project implementation team comprising of 47 regional directors, 47 supply chain officers and 94 prequalified contractors in charge of road construction projects under the Kenya Rural Roads Authority in Kenya, the minimum recommended sample size for the study was calculated as:

$$n = \frac{188}{1 + 188(0.05)^2} = 128$$

Therefore, the minimum recommended sample size consisted of 128 project implementation team comprising of 32 regional directors, 32 supply chain officers and 64 prequalified contractors in charge of road construction projects under the Kenya Rural Roads Authority in Kenya. Table 2 presents the sample size.

Table 2: Sample Size

Strata	Frequency	Sample Size
Regional Directors	47	32
Supply Chain Officers	47	32
Prequalified Contractors in Every County	94	64
Total	**188**	**128**

Sampling Techniques: The proportionate stratified random sampling technique was used to select a sample size of 32 regional directors, 32 supply chain officers and 64 prequalified contractors from a target population of 47 regional directors, 47 supply chain officers and 94 prequalified contractors in charge of road construction projects under the Kenya Rural Roads Authority in Kenya. The choice of the proportionate stratified random sampling technique was justified by the heterogeneous target population.

Data Collection Methods: A self-administered structured questionnaire was the means for collecting primary data. The choice of the data collection method was justified by its ability to collect a large amount of information in a reasonably quick span of time (Saunders & Kulchitsky, 2021).

Data Collection Procedures: A cross-sectional survey-based approach was used to collect primary data. Through the drop and pick method, the researcher and three research assistants hand delivered the survey questionnaire to a random sample of 32 regional directors, 32 supply chain officers and 64 prequalified contractors in charge of the road construction projects under the Kenya Rural Roads Authority in Kenya. A continuous follow up on responses was made by the researcher and research assistants.

Data Processing and Analysis: Data processing and analysis were conducted with respect to the research objectives.

Data Processing: The collected data was coded, edited, and entered into the Statistical Package for Social Sciences (SPSS) version 26 to create a data sheet that was used for statistical analysis.

Descriptive Analysis: Descriptive analysis was performed using SPSS software (version 26) to compute, summarize the data in respect to each variable and describe the sample's characteristics.

Correlation Analysis: The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables.

Regression Analysis: A standard multiple linear analysis was performed with performance of road construction projects as the dependent variable and green purchasing and sustainable supplier management as the predictor variables.

Model Specification: The multiple linear regressions model was specified as:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$ ..... Model 1

Where:

Y = Cost Performance of Road Construction Projects
β_0 = Constant Term
$\beta_1 - \beta_2$ = Regression Coefficients to be estimated
X_1 = Green Purchasing
X_2 = Sustainable Supplier Management
ε = Stochastic Error Term

Hypotheses Testing: In this research, two null hypotheses were tested at 5% level of significance ($\alpha = 0.05$; $t = 1.960$) at a 95% confidence level to statistically help draw acceptable and realistic inferences. Therefore, the decision rule was to reject the H_0i if the $P \leq 0.05$, and otherwise fail to reject the H_0i if the $P > 0.05$. Table 3 presents the hypotheses testing procedure.

Table 3: Hypotheses Testing

Hypotheses	Model	Hypotheses Testing	Decision Rule
$H_0$1: Green purchasing has no significant influence on cost performance of road construction projects in Kenya.	$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$ ..... Model 1	Standard Multiple regression analysis	$H_0$1: $\beta_1 = 0$ $H_1$1: $\beta_1 \neq 0$ If the $P \leq 0.05$ reject the $H_0$1. If the $P > 0.05$ fail to reject the $H_0$1.
$H_0$2: Sustainable supplier management has no significant influence on cost performance of road construction projects in Kenya.			$H_0$2: $\beta_2 = 0$ $H_1$2: $\beta_2 \neq 0$ If the $P \leq 0.05$ reject the $H_0$2. If the $P > 0.05$ fail to reject the $H_0$2.

FINDINGS

Response Rate

Out of the 128 survey questionnaires distributed for the main study, only 105 valid responses were obtained. Therefore, there was a valid response rate of 82.03%, which was adequate for data processing and analysis. Generally, survey response rates of 70% or higher are needed if findings are to be considered generalizable (Ericson *et al.*, 2023). Table 4 presents the response rate results.

Table 4: Response Rate

Strata	Frequency	Percentage
Response	105	82.03%
Non-Response	23	17.97%
Total	**128**	**100.00%**

Correlation Results

The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that green purchasing had a moderately strong positive and significant relationship with cost performance of road construction projects (r = 0.579, p ≤ 0.05) in Kenya. However, the correlation results showed that sustainable supplier management had a strong positive and significant relationship with cost performance of road construction projects (r = 0.743, p ≤ 0.05) in Kenya. Table 5 presents the Pearson's product moment correlation results.

Table 5: The Pearson's Correlation Results

Variable		X_1	X_2	Y
Green Purchasing (X_1)	Pearson Correlation	1	.489**	.579**
	Sig. (2-tailed)		.000	.000
	n	105	105	105
Sustainable Supplier Management (X_2)	Pearson Correlation	.489**	1	.743**
	Sig. (2-tailed)	.000		.000
	n	105	105	105
Cost Performance of Road Construction Projects (Y)	Pearson Correlation	.579**	.743**	1
	Sig. (2-tailed)	.000	.000	
	n	105	105	105

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

Multiple Regression Results

A standard multiple linear analysis was performed with the cost performance of road construction projects as the dependent variable and green purchasing and sustainable supplier management as the predictor variables. The standard multiple linear regression analysis, α = .05 (two-tailed), was conducted to examine the extent to which, if any, of the linear combination of the predictor variables (green purchasing and sustainable supplier management) was able to predict the cost performance of road construction projects in Kenya.

Model Summary

From the model summary in table, it is clear that the value of coefficient of correlation (R) was 0.783, while the value of coefficient of determination (R^2) was 0.613, while the value of the adjusted R^2 was 0.606. Additionally, the value of the std. error of the estimate was 0.233 and the value of the Durbin-Watson test was 2.459. The R value of 0.783 suggest that there was a strong positive correlation between the sustainable procurement practices and the cost performance of road construction projects in Kenya. The R^2 value of 0.613 suggest that the overall model as a whole (the model involving constant, green purchasing and sustainable supplier management) was able to significantly predict and explain approximately 61.3% of the variance in the cost performance of road construction projects in Kenya.

The Adjusted R Square value of 0.606 suggest that the overall model as a whole (the model involving constant, green purchasing and sustainable supplier management) significantly predicted and explained 60.6% of the variance in the cost performance of road construction projects in Kenya. The std. error of the estimate value of 0.233 suggest that there could be other factors not included in the model in the current study that could also predict and explain the remaining 39.4% of the variance in the cost performance of road construction projects in Kenya. Therefore, there is in need for future research to discover the other variables not included in the model in the current study that also predict the remaining variance in the cost performance of road construction projects in Kenya.

From the model summary table, the Durbin-Watson test statistic had a value of 2.459, falling within the optimum range of 1.5 to 2.5, suggesting that there was no severe autocorrelation detected in the in

the residual values in the datasets. Generally, Durbin-Watson statistics falling within the optimum range of 1.5 to 2.5 indicates that there is no severe autocorrelation detected in the in the residual values in the datasets (Hair *et al.*, 2021). Table 6 presents the model summary results.

Table 6: Model Summary[b] Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.783[a]	.613	.606	.233	2.459

a. Predictors: (Constant), Sustainable Supplier Management (X_2), Green Purchasing (X_1)
b. Dependent Variable: Cost Performance of Road Construction Projects (Y)

Analysis of Variance

From the Analysis of Variance (ANOVA) table, the overall model as a whole (the model involving constant, green purchasing and sustainable supplier management), achieved a high degree of fit, as reflected by $R^2 = 0.613$, adj. $R^2 = 0.606$, $F(2, 102) = 80.826$, $p \leq 0.05$. The null hypothesis was that the linear combination of predictor variables (green purchasing and sustainable supplier management) was not able to significantly predict the cost performance of road construction projects in Kenya. However, the alternative hypothesis was that the linear combination of predictor variables (green purchasing and sustainable supplier management) was able to significantly predict the cost performance of road construction projects in Kenya. The standard multiple linear regression results showed that the linear combination of predictor variables (green purchasing and sustainable supplier management) significantly predicted the cost performance of road construction projects in Kenya. The null hypothesis was rejected in favor of the alternative hypothesis. Therefore, the decision was that the linear combination of predictor variables (green purchasing and sustainable supplier management) significantly predict the cost performance of road construction projects in Kenya. Table 7 presents the ANOVA results.

Table 7: ANOVA[a] Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.745	2	4.372	80.826	.000[b]
	Residual	5.518	102	.054		
	Total	**14.263**	**104**			

a. Dependent Variable: Cost Performance of Road Construction Projects (Y)
b. Predictors: (Constant), Sustainable Supplier Management (X_2), Green Purchasing (X_1)

Multiple Regression Coefficients

From the coefficients table, when the unstandardized regression coefficients (B) were substituted to the multiple regression model specified for the study, the final predictive equation was:

$$Y = 1.899 + 0.169X_1 + 0.354X_2$$

The final predictive equation suggested that holding all factors in to account constant (green purchasing and sustainable supplier management), constant at zero, the cost performance of road construction projects in Kenya would be 1.899. Additionally, the final predictive equation postulated that with all other factors held constant, a unit increase in green purchasing would lead to 0.169 unit increase in the cost performance of road construction projects in Kenya. Moreover, the final predictive equation suggested that with all other factors held constant, a unit increase in sustainable supplier management would lead to 0.354 unit increase in the cost performance of road construction projects in Kenya. Based on the magnitude of the unstandardized regression coefficients (B) of the independent variables, sustainable supplier management was the best predictor of the variance in the cost performance of road construction projects in Kenya.

The multiple regression results indicated that green purchasing had a positive and significant influence on the performance of road construction projects (β_1 = 0.284; t = 4.029; p ≤ 0.05) in Kenya. The regression results indicated that sustainable supplier management had a positive and significant influence on the performance of road construction projects (β_2 = 0.604; t = 8.551; p ≤ 0.05) in Kenya. Table 8 presents the multiple regressions coefficients results.

Table 8: Multiple Regression Coefficients[a] Results

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	1.899	.160		11.871	.000		
Green Purchasing (X_1)	.169	.042	.284	4.029	.000	.771	1.297
Sustainable Supplier Management (X_2)	.354	.041	.604	8.551	.000	.761	1.314

a. Dependent Variable: Cost Performance of Road Construction Projects (Y)

Hypotheses Test Results

In this research, 4 null hypotheses were tested. The hypotheses were tested at 5% level of significance, α = 0.05, t = 1.960, and 95% confidence level to statistically help draw acceptable and realistic inferences. Therefore, the decision rule was to reject the null hypothesis H_0i if the P ≤ 0.05, and otherwise fail to reject the null hypothesis H_0i if the P > 0.05.

Hypothesis One Test Results

The first null hypothesis ($H_0$1) predicted that green purchasing has no significant influence on cost performance of road construction projects in Kenya. The decision rule was to reject the null hypothesis $H_0$1 if the $\beta_1 \neq 0$, t ≥ 1.960, P ≤ 0.05, and otherwise fail to reject the null hypothesis $H_0$1 if the $\beta_1 = 0$, t < 1.960, P > 0.05. The standard multiple regression results showed that green purchasing had a positive and significant influence on the performance of road construction projects (β_1 = 0.284; t = 4.029; p ≤ 0.05) in Kenya. Consequently, the $H_0$1 was rejected, providing the empirical support for $H_1$1. Therefore, deduction was made that green purchasing has a significant influence on cost performance of road construction projects in Kenya.

Hypothesis Two Test Results

The second null hypothesis ($H_0$2) predicted that sustainable supplier management has no significant influence on cost performance of road construction projects in Kenya. The decision rule was to reject the null hypothesis $H_0$1 if the $\beta_1 \neq 0$, t ≥ 1.960, P ≤ 0.05, and otherwise fail to reject the null hypothesis $H_0$1 if the $\beta_1 = 0$, t < 1.960, P > 0.05. The standard multiple regression results showed that sustainable supplier management had a positive and significant influence on the performance of road construction projects (β_2 = 0.604; t = 8.551; p ≤ 0.05) in Kenya. Consequently, the $H_0$2 was rejected, providing the empirical support for $H_1$2. Therefore, deduction was made that sustainable supplier management has a significant influence on cost performance of road construction projects in Kenya. Table 9 presents the hypotheses test results.

Table 9: Hypotheses Test Results

Hypothesis	β	t	Sig.	Decision
$H_0$1: Green purchasing has no significant influence on cost performance of road construction projects in Kenya.	.284	4.029	.000	Reject the $H_0$1
$H_0$2: Sustainable supplier management has no significant influence on cost performance of road construction projects in Kenya.	.604	8.551	.000	Reject the $H_0$2

Discussions

The purpose of this quantitative correlational research was to examine the influence of sustainable procurement practices on the cost performance of road construction projects in Kenya. Specifically, the research sought to examine the influence of green purchasing and sustainable supplier management practices on the cost performance of road construction projects in Kenya. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that the sustainable procurement practices had positive and significant relationship with cost performance of road construction projects in Kenya. A standard multiple linear analysis was performed with performance of road construction projects as the dependent variable and green purchasing and sustainable supplier management as the predictor variables. The regression results showed that the sustainable procurement practices had positive and significant influence on the cost performance of road construction projects in Kenya. The findings were consistent with the results of previous studies (Agyapong *et al.*, 2024; Mudashir *et al.*, 2024; Nangpiire *et al.*, 2024).

The first specific objective was to determine the influence of green purchasing on the cost performance of road construction projects in Kenya. The first null hypothesis ($H_0$1) predicted that green purchasing has no significant influence on cost performance of road construction projects in Kenya. The Pearson's correlation results indicated that green purchasing had a moderately strong positive and significant relationship with the cost performance of road construction projects in Kenya. The regression results showed that green purchasing had a positive and significant influence on cost performance of road construction projects in Kenya. The $H_0$1 was rejected, providing the empirical support for $H_1$1. Therefore, the decision was that green purchasing has a significant influence on cost performance of road construction projects in Kenya. The findings were in harmony with the results of previous studies (Balin & Sari, 2023; Nugroho *et al.*, 2024; Wungkana *et al.*, 2023).

The second specific objective was to assess the influence of sustainable supplier management on cost performance of road construction projects in Kenya. The second null hypothesis ($H_0$2) predicted that sustainable supplier management has no significant influence on cost performance of road construction projects in Kenya. The Pearson's correlation results indicated that sustainable supplier management had a strong positive and significant relationship with cost performance of road construction projects in Kenya. The regression results showed that sustainable supplier management had a positive and significant influence on cost performance of road construction projects in Kenya. The $H_0$2 was rejected, providing the empirical support for $H_1$2. Therefore, the decision was that sustainable supplier management has a significant influence on cost performance of road construction projects in Kenya. The findings were consistent with the results of past studies (Changalima *et al.*, 2022; Changalima *et al.*, 2023).

SUMMARY

The purpose of this quantitative correlational research was to examine the influence of sustainable procurement practices on cost performance of road construction projects in Kenya. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that the sustainable procurement practices had positive and significant relationship with cost performance of road construction projects in Kenya. A standard multiple linear analysis was performed with performance of road construction projects as the dependent variable and green purchasing and sustainable supplier management as the predictor variables. The regression results showed that the sustainable procurement practices had positive and significant influence on the cost performance of road construction projects in Kenya.

The first specific objective was to determine the influence of green purchasing on the cost performance of road construction projects in Kenya. The first null hypothesis ($H_0$1) predicted that green purchasing has no significant influence on cost performance of road construction projects in Kenya. The Pearson's correlation results indicated that green purchasing had a moderately strong positive and significant relationship with the cost performance of road construction projects in Kenya. The regression results showed that green purchasing had a positive and significant influence on cost performance of road construction projects in Kenya. The $H_0$1 was rejected, providing the empirical support for $H_1$1. Therefore, the decision was that green purchasing has a significant influence on cost performance of road construction projects in Kenya.

The second specific objective was to assess the influence of sustainable supplier management on cost performance of road construction projects in Kenya. The second null hypothesis ($H_0$2) predicted that sustainable supplier management has no significant influence on cost performance of road construction projects in Kenya. The Pearson's correlation results indicated that sustainable supplier management had a strong positive and significant relationship with cost performance of road construction projects in Kenya. The regression results showed that sustainable supplier management had a positive and significant influence on cost performance of road construction projects in Kenya. The $H_0$2 was rejected, providing the empirical support for $H_1$2. Therefore, the decision was that sustainable supplier management has a significant influence on cost performance of road construction projects in Kenya.

CONCLUSION

The purpose of this quantitative correlational research was to examine the influence of sustainable procurement practices on cost performance of road construction projects in Kenya. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that the sustainable procurement practices had positive and significant relationship with cost performance of road construction projects in Kenya. A standard multiple linear analysis was performed with performance of road construction projects as the dependent variable and green purchasing and sustainable supplier management as the predictor variables. The regression results showed that the sustainable procurement practices had positive and significant influence on the cost performance of road construction projects in Kenya. Therefore, the conclusion was that sustainable procurement practices have significant influence on cost performance of road construction projects in Kenya.

The first specific objective was to determine the influence of green purchasing on the cost performance of road construction projects in Kenya. The first null hypothesis ($H_0$1) predicted that green purchasing has no significant influence on cost performance of road construction projects in Kenya. The Pearson's correlation results indicated that green purchasing had a moderately strong positive and significant relationship with the cost performance of road construction projects in Kenya. The regression results showed that green purchasing had a positive and significant influence on cost performance of road construction projects in Kenya. The $H_0$1 was rejected, providing the empirical support for $H_1$1. Therefore, the first conclusion was that green purchasing has a significant influence on cost performance of road construction projects in Kenya.

The second specific objective was to assess the influence of sustainable supplier management on cost performance of road construction projects in Kenya. The second null hypothesis ($H_0$2) predicted that sustainable supplier management has no significant influence on cost performance of road construction projects in Kenya. The Pearson's correlation results indicated that sustainable supplier management had a strong positive and significant relationship with cost performance of

road construction projects in Kenya. The regression results showed that sustainable supplier management had a positive and significant influence on cost performance of road construction projects in Kenya. The $H_0 2$ was rejected, providing the empirical support for $H_1 2$. Therefore, the second conclusion was that sustainable supplier management has a significant influence on cost performance of road construction projects in Kenya.

RECOMMENDATIONS

From the findings of this research, the research recommends that the project managers should implement sustainable procurement practices to foster the performance of road construction projects.

From the findings of this research, the research recommends that the policy makers within construction industry should to review the policy framework to encourage project managers to implement sustainable procurement practices to foster the performance of road construction projects.

Limitations and Future Research

This research paper generates novel insights into how sustainable procurement practices predict the performance of road construction projects. However, the current research has a number of limitations, that need to be taken into consideration. First, the research was limited to the influence of sustainable procurement practices on cost performance of road construction projects in Kenya. Subsequently, caution should be taken when attempting to generalize the results beyond the construction industry. Future research could examine the influence of sustainable procurement practices on project performance in other sectors or in other regions. Second, the research was contextually limited to only two sustainable procurement practices, namely green purchasing and sustainable supplier management. Future research should examine the influence of other sustainable procurement practices on performance of road construction projects. Third, as the research paper relied on a cross-sectional survey design, no inferences about the causality of relationships can be made. Therefore, future researchers should consider conducting a longitudinal study on the influence of sustainable procurement practices on performance of road construction projects.

REFERENCES

Adom, K., & Ackom, B. (2024). Towards a greater understanding of the prevalence of immigrant entrepreneurship in the informal economy of Ghana: An institutional theory perspective. *Journal of African Business*, *25*(2), 264-286.

Agyapong, G. K., Opoku, R. K., Asiedu, A., & Frimpong, S. E. (2024). Sustainable procurement practices and sustainable performance: Evidence from small and medium-sized manufacturing enterprises in an emerging economy. *International Journal of Procurement Management*, *20*(1), 1-32.

Al Fath, A. A., Herwindiaty, D. E., Wibowo, M. A., & Sari, E. M. (2024). Readiness for implemented sustainable procurement in Indonesian government construction project. *Buildings*, *14*(5), 1424.

Al-Nahhas, Y. S., Hadidi, L. A., Islam, M. S., Skitmore, M., & Abunada, Z. (2024). Modified Mamdani-fuzzy inference system for predicting the cost overrun of construction projects. *Applied Soft Computing*, *151*, 111152.

Bai, C., Govindan, K., & Dhavale, D. (2024). Optimal selection and investment-allocation decisions for sustainable supplier development practices. *Annals of Operations Research*, *335*(1), 1-31.

Balin, A. I., & Sari, K. (2023). The effect of green purchasing practices on financial performance under the mediating role of environmental performance: Evidence from Türkiye. *Sustainability*, *15*(4), 3617.

Bolaji, B. H., Abdul Rahim, M. K. I., & Omar, S. (2024). Integrating green practices and environmental performance: Evidence from Nigeria's SME sector. *International Journal of Sustainable Development & Planning*, *19*(2), 469-456.

Chamuwange, S. K., & Ning, Y. (2022). Identifying the factors affecting the cost management of road construction projects in Tanzania. *Journal of Civil, Construction and Environmental Engineering*, *7*(3), 35-39.

Chang, Y., Wang, X., Wang, J., Wu, Y., Yang, L., Zhu, K., ... & Xie, X. (2024). A survey on evaluation of large language models. *ACM Transactions on Intelligent Systems and Technology*, *15*(3), 1-45.

Changalima, I. A., & Mdee, A. E. (2023). Procurement skills and procurement performance in public organizations: The mediating role of procurement planning. Cogent Business & Management, 10(1), 2163562. doi.org/10.1080/ 23311975.2022.2163562

Changalima, I. A., Ismail, I. J., & Mchopa, A. D. (2021a). A review of the forms, rationale, and challenges of supplier development in public procurement: Lessons for public buyers in Tanzania. *Future Business Journal*, *7*(1), 1-10. doi.org/10.1186/s43093-021- 00108-2

Changalima, I. A., Ismail, I. J., & Mchopa, A. D. (2023). Effects of supplier selection and supplier monitoring on public procurement efficiency in Tanzania: A cost-reduction perspective. *Vilakshan-XIMB Journal of Management*, (ahead-of-print).

Changalima, I. A., Israel, B., Amani, D., Panga, F. P., Mwaiseje, S. S., Mchopa, A. D., Kazungu, I., & Ismail, I. J. (2023). Do internet marketing capabilities interact with the effect of procedural capabilities for public procurement participation on SMEs' sales performance? *Journal of Public Procurement*, *23*, 416–433. doi.org/10.1108/ JOPP-01-2023-0001

Changalima, I. A., Mchopa, A. D., & Ismail, I. J. (2022). Supplier development and public procurement performance: does contract management difficulty matter?. *Cogent Business & Management*, *9*(1), 2108224.

Changalima, I. A., Mchopa, A. D., & Ismail, I. J. (2023). Supplier monitoring and procurement performance in the public sector in Tanzania: the moderating role of contract management difficulty. *IIM Ranchi Journal of Management Studies*, *2*(1), 16-30.

Changalima, I. A., Mushi, G. O., & Mwaiseje, S. S. (2021b). Procurement planning as a strategic tool for public procurement effectiveness: Experience from selected public procuring entities in Dodoma city, Tanzania. *Journal of Public Procurement*, *21*(1), 37–52. doi.org/10.1108/JOPP-05-2020-0047

Chen, F., van Dalen, J., & Wynstra, F. (2024). The grey side of procurement: Measuring the prevalence of questionable purchasing practices. *Journal of Purchasing and Supply Management*, 100922.

Cooper, D. J., Ezzamel, M., & Willmott, H. (2008). Examining "institutionalization": A critical theoretic perspective. *The Sage handbook of organizational institutionalism*, *673*, 701-713.

Di Mauro, C., Peters, E., & Carnovale, S. (2024). A seat at the table: The future of purchasing and supply management. *Journal of Purchasing and Supply Management*, 100908.

Eitrem, A., Meidell, A., & Modell, S. (2024). The use of institutional theory in social and environmental accounting research: a critical review. *Accounting and Business Research*, 1-36.

Eretan, G. O. (2024). Effect of project procurement management practices on project performance in Nigeria. *The International Journal of Business Management and Technology*, *8*(1), 1-11.

Ershadi, M., Jefferies, M., Davis, P., & Mojtahedi, M. (2021). Achieving sustainable procurement in construction projects: The pivotal role of a project management office. *Construction Economics and Building*, *21*(1), 45-64.

Elserougy, M., Khodeir, L. M., & Fathy, F. (2024). Practices and techniques for construction projects cost control-a critical review. *HBRC Journal*, *20*(1), 525-552.

Etse, D., McMurray, A., & Muenjohn, N. (2023). Sustainable procurement practice: The effect of procurement officers' perceptions. *Journal of business ethics*, *184*(2), 525-548.

Foroudi, M. M., & Foroudi, P. (2024). Mixed-methods approach: Combining qualitative and quantitative methods. In *Researching and Analysing Business* (pp. 7-40). Routledge.

Forster, R., Lyons, A., Caldwell, N., Davies, J., & Sharifi, H. (2024). A lifecycle analysis of complex public procurement: an agency-institutional theory perspective. *International Journal of Operations & Production Management*.

Gatari, C. N. (2023). *Public procurement practices and sustainable performance of state corporations in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Glynn, M. A., & D'aunno, T. (2023). An intellectual history of institutional theory: Looking back to move forward. *Academy of Management Annals*, *17*(1), 301-330.

Govindan, K., & Jha, P. C. (2024). Modelling of barriers in implementing sustainable manufacturer-supplier collaboration and coping strategies. *Journal of Cleaner Production*, *434*, 139635.

Gusbian, T., & Amin, M. (2024). Analysis of factors affecting the cost performance of road improvement work in Serang Regency. *ASTONJADRO*, *13*(1), 251-258.

Harris, O., Marleno, R., & Oetomo, W. (2024). Analysis of cost and time for the completion of the maintenance project of the Karetan-Sambimulyo road in Banyuwangi Regency. *Journal of Management, Accounting, General Finance and International Economic Issues*, *3*(2), 432-437.

Hazaea, S. A., Al-Matari, E. M., Zedan, K., Khatib, S. F., Zhu, J., & Al Amosh, H. (2022). Green purchasing: Past, present and future. *Sustainability*, *14*(9), 5008.

Kankanamge, D., & Ruparathna, R. (2024). Sustainable procurement of water supply infrastructure projects: a building information modeling-based approach. *Sustainable and Resilient Infrastructure*, 1-18.

Khan, O., & Hinterhuber, A. (2024). The role of willingness to pay for sustainable procurement in improving organizational performance. In *Sustainability, Social Responsibility, and Social Justice* (Vol. 35, pp. 1203-1204). American Marketing Association.

Khan, O., & Hinterhuber, A. (2024). The role of willingness to pay for sustainable procurement in improving organizational performance. In *Sustainability, Social Responsibility, and Social Justice* (Vol. 35, pp. 1203-1204). American Marketing Association.

Kitungo, K. K., & Musembi, A. K. (2024). Project planning practices and performance of Kenya Rural Roads Authority Projects in Machakos County. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, *8*(2), 912-921.

Kozuch, A., Langen, M., von Deimling, C., & Eßig, M. (2023). Does green procurement pay off? Assessing the practice–performance link employing meta-analysis. *Journal of Cleaner Production*, 140184.

Kumar, S. (2022a). Emergence of sustainable public procurement as a strategic instrument. In *Understanding Sustainable Public Procurement: Reflections from India and the World* (pp. 17-85). Cham: Springer International Publishing.

Kumar, S. (2022b). Status of sustainable procurement implementation. In *Understanding Sustainable Public Procurement: Reflections from India and the World* (pp. 87-151). Cham: Springer International Publishing.

Lawrence, T. B., & Suddaby, R. (2006). *1.6 institutions and institutional work* (Vol. 2, pp. 215-254). The Sage handbook of organization studies.

Li, Y. L., Tsang, Y. P., Wu, C. H., & Lee, C. K. M. (2024). A multi-agent digital twin–enabled decision support system for sustainable and resilient supplier management. *Computers & Industrial Engineering*, *187*, 109838.

Lin, T. C., & Yeh, M. L. (2024). Factors influencing the evolution of information ecosystems: an institutional theory perspective. *Aslib Journal of Information Management*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/AJIM-12-2023-0565

Lou, S., You, X., & Xu, T. (2024). Sustainable supplier evaluation: From current criteria to reconstruction based on ESG requirements. *Sustainability*, *16*(2), 757.-768

Ludin, D., Wellbrock, W., Mueller, E., & Herterich Suzana, A. (2023). Responsible management education and digital transformation beyond SDG 12: BA sustainable procurement management at Heilbronn University's bachelor's program as an example for integrating SDGs and future digital skills requirements. In *The Future of Responsible Management Education: University Leadership and the Digital Transformation Challenge* (pp. 245-258). Cham: Springer International Publishing.

Mchopa, A. D., Changalima, I. A., Sulle, G. R., & Msofe, R. M. (2024). Public procurement trajectories in Tanzania: A review of reforms, practices, and compliance. *Cogent Business & Management*, *11*(1), 2300498.

Mchopa, A. L. (2022). *Effects of supplier selection and supplier monitoring on public procurement efficiency in Tanzania: a cost-reduction perspective*. Emerland Publishing Ltd.

Mchopa, A., Mashene, A., Mwaiseje, S., & Israel, B. (2019). Ethical procurement practices and performance of public procuring entities in Tanzania: empirical evidences from Moshi district council.

Msakwa, Y. A. (2023). *Assessment of sustainable procurement in achieving construction projects* (Masters dissertation, Institute of Accountancy Arusha (IAA).

Mudashir, R. M., Zadawa, A. N., & Mohammed, M. M. (2024). Influence of sustainable procurement practices on project delivery in Nigeria construction industry. *International Journal of African Development and Sustainable Research*, *3*(2), 1-19.

Mugweru, D., & Muchelule, Y. (2022). Project schedule and performance of road construction projects at the Kenya National Highways Authority. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, *6*(1), 159-169.

Musarat, M. A., Alaloul, W. S., & Liew, M. S. (2021). Influence of inflation rate on construction projects budget: A review. *Ain Shams Engineering Journal*, *12*(1), 407-414.

Najafi, M., Sheikhkhoshkar, M., & Rahimian, F. (2024). Innovation and lean practices for sustainable construction project management; emerging technologies, strategies and challenges. *Smart and Sustainable Built Environment*, *13*(3), 473-478.

Nangpiire, C., Gyebi, F. O., & Nasse, T. (2024). Sustainable procurement practices and organisational performance of small and medium enterprises in Ghana. *International Journal of Economics and Financial Issues*, *14*(1), 95-106.

Nawaz, A., & Guribie, F. L. (2024). Impacts of institutional isomorphism on the adoption of social procurement in the Chinese construction industry. *Construction Innovation*, *24*(3), 846-862.

Nugroho, W., Tarigan, Z., & Siagian, H. (2024). The influence of top management commitment on the operational performance through the mediating role of the green purchasing and iso 14000 implementation. *Journal of Future Sustainability*, *4*(1), 11-22.

Opoku, A., Deng, J., Elmualim, A., Ekung, S., Hussien, A. A., & Abdalla, S. B. (2022). Sustainable procurement in construction and the realisation of the sustainable development goal (SDG) 12. *Journal of cleaner production*, *376*, 134294.

Pan, J., Zhao, X., Guo, W., Feng, Y., Liu, Y., Zhu, J., & Fang, J. (2024). Characterizing China's road network development from a spatial entropy perspective. *Journal of Transport Geography*, *116*, 103848.

Rachmawati, F., Mudjahidin, M., & Dewi Widowati, E. (2024). Work rate modeling of building construction projects using system dynamic to optimize project cost and time performance. *International Journal of Construction Management*, *24*(2), 213-225.

Rodriguez Trejo, S., Najafi, M., & Rahimian, F. (2024). Breaking the mold, circular construction for a greener and more efficient built environment. *Smart and Sustainable Built Environment*, *13*(2), 241-245.

Salih, F., & El-adaway, I. H. (2024). Quantifying the Impact of Technology Utilization on Schedule and Cost Performance in Construction Projects. *Journal of Construction Engineering and Management*, *150*(8), 04024078.

Sharma, V. K., Gupta, P. K., & Khitoliya, R. K. (2021). Investigation of critical factors influencing cost overrun in highway construction projects. In *3rd International Conference on Innovative Technologies for Clean and Sustainable Development: ITCSD 2020 3* (pp. 327-336). Springer International Publishing.

Sheikhkhoshkar, M., Bril El-Haouzi, H., Aubry, A., & Hamzeh, F. (2023). Functionality as a key concept for integrated project planning and scheduling methods. *Journal of Construction Engineering and Management*, *149*(7), 04023053.

Siddiquee, M., Shaha, P., & Hasin, A. (2024). Greening the pillars of pharmaceuticals: Sustainable supplier selection in emerging economies. *Journal of Future Sustainability*, *4*(3), 159-168.

Slastanova, N., Palus, H., Sulek, R., Parobek, J., & Slastanova, K. (2021). The benefits of applying the green purchasing. In *SHS Web of Conferences* (Vol. 92, p. 06037). EDP Sciences.

Stefanovic, L. (2022). SDG performance in local organic food systems and the role of sustainable public procurement. *Sustainability*, *14*(18), 11510.

Wungkana, F., Siagian, H., & Tarigan, Z. (2023). The influence of eco-design, green information systems, green manufacturing, and green purchasing on manufacturing performance. *International Journal of Data and Network Science*, *7*(3), 1045-1058.

Yazdani, M., Ariza-Montes, A., Arjona-Fuentes, J. M., & Radic, A. (2024). Cruise hotel sustainable supplier management using a grey-based decision support framework. *Journal of Travel & Tourism Marketing*, *41*(4), 538-558.

Yee, F. M., Shaharudin, M. R., Ma, G., Zailani, S. H. M., & Kanapathy, K. (2021). Green purchasing capabilities and practices towards Firm's triple bottom line in Malaysia. *Journal of Cleaner Production*, *307*, 127268.

Yin, S., Jiang, M., Chen, L., & Jia, F. (2024). Digital transformation and the circular economy: an institutional theory perspective. *Industrial Management & Data Systems*, *124*(4), 1627-1655.

Zhao, P., Ji, S., & Ji, Y. (2024). An interactive possibilistic programming approach for sustainable supplier selection and inventory management problem in the physical internet. *Kybernetes*.

Zhou, Y., Wang, X., Gosling, J., & Naim, M. M. (2023). The system dynamics of engineer-to-order construction projects: past, present, and future. *Journal of Construction Engineering and Management*, *149*(5), 03123004.