



MODERATING EFFECT OF QUALITY MANAGEMENT SYSTEM ON THE RELATIONSHIP BETWEEN INBOUND LOGISTIC STRATEGIES AND SUSTAINABLE PROCUREMENT PERFORMANCE AMONG KENYA TEA DEVELOPMENT AGENCY FACTORIES IN KENYA

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ABSTRACT

Kenya Tea Development Agencies factories have adopted inbound logistics strategies as well as quality management system with the aim of turning around their performance and hence reduce on operational costs leading to sustainable procurement performance. However, despite this, the factories still experience wide variations in earnings. The drop in earnings and high variation in tea bonuses among factories has been blamed on operational cost at the factory and the quality management system being adopted by these factories. This points out that although inbound logistics have been adopted, they have not resulted in sustainable procurement performance. The purpose of this study was to establish the moderating effect of quality management system on the relationship between inbound logistic strategies and sustainable procurement performance among Kenya Tea Development Agencies Factories in Kenya. The study adopted correlation research design. The target population of the study was 188 staff drawn from the 16 Kenya Tea Development Agencies managed Region 5 factories. A census method was used to collect data from the production managers, information communication technology managers, procurement Managers, leaf base managers, factory unit managers and directors using a structured questionnaire. The validity of the instrument was determined through professional judgment and reliability was determined using Cronbach's alpha coefficient where the alpha coefficient of 0.865 was actualized. The findings revealed the moderating effect of quality management system had a positive significant relationship on inbound logistic strategies and sustainable procurement performance ($r = 0.526, p < 0.05$). The results showed that R Square changed from 30.8% to 41.2% as a result of the moderator effect of quality management system and that changed was significant. The study recommends that factories sourcing strategies need to employ quality management system by following total quality concept's guiding principles in the management and purchase of material resources. The study findings contribute to the existing body of knowledge in relation to the moderating effect of quality management system on the relationship between inbound logistic strategies and sustainable procurement performance by creating new knowledge. The results of this study may advice on policy formulation in relation to quality management system on inbound logistics strategies and sustainable procurement performance. Other researchers may benefit from the literature on inbound logistics and sustainable procurement performance since the current study provided a basis for further studies.

KEY WORDS: Inbound Logistics, Quality Management System and Sustainable Procurement Performance

1.0 INTRODUCTION

According to Kimaro (2020), inbound logistics strategies deal with the transfer of goods from the supplier to the organization that makes purchases so as to foster business efficiency by providing the products, spare parts, and materials needed for regular operations. It entails inbound shipment collection and transportation, material handling, and warehousing with the objectives of cost reduction, inventory optimization, and customer service (Baker and Rushton, 2018). According to Mugo (2017), organization will have a competitive advantage in their sustainable procurement by incorporating quality management since supplier social sustainability standards will be implemented throughout supply chain which focuses on labor rights, health and safety, societal responsibility, diversity, and product accountability.

A review of the literature on techniques and sources for sustainable supplier selection was published in 2019 in Iran by Alikhani *et al.*, Multi-Criteria Decision-Making (MCDM) strategies were shown to be the most popular, according to the findings. Selecting sustainable suppliers is an essential SSCM choice because of the overall effect it has on the organization's sustainability performance. The upstream



supply chain was established in a study in Germany that it must be integrated for this decision to yield the greatest benefits, (Zimmer, Frohling, & Schultmann, 2016).

Khan, Kusi-Sarpong, Arhin, & Kusi-Sarpong (2018), did a study in Pakistan and suggested a system for evaluating and choosing suppliers based on their success in terms of sustainability. The findings reveal that among economic, environmental, and social sustainability dimensions, the top three parameters are quality representing 10.87%, Cleaner Technology Implementation representing 11.51%, and Information Disclosure which represented 13.75%. The top suppliers in terms of the triple sustainability dimension were those whose suppliers disclose their information.

In Kenya, according to Tea of Board Kenya (2018), poor infrastructure, unstable electricity, expensive fuel, and expensive packing materials are examples of inbound logistical activities that drives manufacturing costs. The restriction on obtaining wood fuel from the forest also severely affected the factories. This is as a result of the tea being dried using wood fuel. The manufacturers have been forced to buy fuel from farms where trees are scarce and consequently sold at excessive costs ever since the prohibition went into place three years ago.

Quality is considered as one of the fundamental components of any product that is essential not only for firms' sustainability but also for customers retention (Pambreni, Khatibi, Azam, & Tham, 2019). It is a key factor that provides the competitive edge to the organizations over their rivalry firms, that is why considered important for their survival. Therefore, recently, businesses particularly, manufacturing concerns paid much attention towards maintaining their products and service quality. They are continuously working on quality enhancement by compliance of international quality standards (Sahoo & Yadav, 2018).

Most of the manufacturing organizations in Kenya are ISO 9001 certified organizations, and they have implemented QMS according to the guidelines of ISO 9001 standards. QMS with manufacturing execution systems develop the strategies and provide complete information about the product development process that help to improve its quality, design, features and customers' requirements in future. This information also helps to achieve production optimization, allowing quicker ramp up in manufacturing, decreasing delivery time and risk, wastage and per-item cost. The manufacturing sectors through ISO implementation can produce better quality products, expand business opportunities and hence remain sustainable (Sreekumar & Rajmohan, 2019).

Sustainable procurement is about socially and ethically responsible purchasing, minimizing environmental impact through supply chain, delivering economically sound solutions and good business practice (CIPS, 2014). The UK Governments Sustainable Procurement Task Force (2012) identified sustainable procurement as a purchasing investment process that takes into account the economic, environmentally and social impacts of the entity's spending.

In USA, Pettit, Croxton & Fiksel (2019), cites eight reasons for conducting a sustainability assessment for suppliers, including the following, aligning your organization's sustainability initiatives with its suppliers/customers to save and reduce costs; receiving a results-oriented supplier/customer review of sustainability efforts; gaining knowledge of the various supplier/customer sustainability initiatives; identifying supplier/customer strengths and opportunities for sustainability improvements; and improving overall sustainability.

According to Mathivathanan, Kannan and Haq's (2018), in India, sustainable procurement performance entails, selection, development, and assessment of suppliers, as well as marketing of a company's products and services. The findings showed that the most effective methods for adopting sustainable supply chain management are management commitment to sustainability and integrating the triple bottom line strategy into strategic decision making which KTDA managed factories need to consider.

Kenya Tea Development Authority, one of the biggest private tea management companies in the country, changed its name to Kenya Tea Development Agency Limited in 2000 and was incorporated as a private company under the Companies Act CAP 486, (KTDA, 2013). Kenya's small-scale tea industry is managed by KTDA with seven tea-growing regions represented by the board of directors who oversees the company management. KTDA is in charge of overseeing 66 factories which use the same type of business strategy.

1.1 Statement of the Problem

KTDA receives tea from small-scale farmers, process it and ensure proper marketing. Good supply chain management techniques are needed both upstream and downstream for all of these activities since they involve complex supply chains with value addition. Supply chain activities may be disrupted, resulting in losses, which could prevent KTDA factories from operating efficiently if proper supply chain management procedures are not put into place. Farmers whose produce is marketed by KTDA have seen their earnings drop annually by a quarter or 25% to Sh46.45 billion from Sh62 billion. There is also wide variation in bonuses payment with factories in the East receiving very high bonuses rate as compared to the factories in the West of Rift. The second payment known as tea bonus dropped



by 36% to Sh28 billion, compared to Sh 44 billion where farmers in Kiambu, Muranga, Nyeri, Kirinyaga, Embu and Meru earned more per kilo compared to their peers in Kericho, Bomet, Kisii, Nyamira, Vihiga, Kakamega and Nandi. The drop in earnings and high variation in tea bonuses among factories has been attributed to operational cost at the factory. This points out that although inbound logistics have been adopted, they have not resulted in sustainable procurement performance. Most of the previous studies have focused on inbound logistics and performance but limited studies have been done on sustainable procurement performance. Many others have been done on government corporations, telecommunication industry, cement manufacturing industries, transportation firms and other sectors leaving the tea industry largely unexplored. There was need to determine the moderating effect of quality management system on the relationship between inbound logistic strategies and sustainable procurement performance of KTDA tea factories in Kenya.

2.0 LITERATURE REVIEW

Wilcock & Boys (2014), a quality management system that adheres to ISO 9000 and ISO 9000: 2005 standards, ISO 9001: 2008 standards, and ISO 9004: 2009 standards can help a business succeed over the long term. The most significant expectations those of customers, shareholders, suppliers, and the community were taken into consideration when developing these criteria, which aim to consistently enhance performance.

Daoud (2021) evaluated the moderating effect on ISO 9001 Certification on the relationship between quality management practices and innovation for 81 firms from the manufacturing sector in Tunisia. Structural equation modelling is used to establish the causal relationship between the variables. The study utilized Mann-Whitey test to compare the QM practices and innovation in ISO and non ISO certifies firms. The study findings did not support the effect of ISO 9001 Certification. The study could not establish the extent to which ISO 9001 could influence the relationship between QM practices and innovation.

Siva *et al.*, (2016), in Sweden, highlighted the importance of quality management (QM) for organizational sustainability and suggested more research into QM tools and techniques to support the advancement of business sustainability. Ikay and Aslan (2011), looked at the performance variations between ISO-certified and non-certified businesses in their study of 255 Turkish SMEs. SME representatives received 892 questionnaires via email, with a response rate of 32.9%. A one-way analysis of variance was used to compare the effectiveness and standards of quality used by certified and non-certified businesses (one-way ANOVA). No statistically significant performance difference between certified and noncertified firms was found, according to the results. Certification had no effect on performance.

Camilleri (2021), in United Kingdom, cite the Balanced Scorecard Measures that Drive Performance with 12 organizations as an innovative approach to performance management. Top managers may quickly and thoroughly view their business with the help of the solution. Both financial and non-financial variables were used in the study to evaluate performance. To ascertain the association between ISO certification and performance in Kenya, the data was studied using regression analysis in the current study. The methodology gap was closed by the results, which demonstrated that there was a meaningful association between variables.

In a study by Jovanović & Filipović (2016), in Serbia, examined the impact of ISO 9000 quality management systems (SME) on manufacturing in small and medium-sized enterprises. The outcomes of a sample pool of 106 SMEs, 79 of which had implemented ISO 9000 standards, show that standard implementation has a considerable impact on the performance of the firm between certified and non-certified firms. Similar results in the analysis of production parameters and competitive priorities demonstrate that firms gain greatly, prompting the necessity for this study to determine how it alters sustainable procurement.

Siongok (2016), looked at the effectiveness of the procurement techniques employed by Kenyan state corporations by analyzing the impact of control planning, quality, procedures, policies, and reporting on the effectiveness of state corporation procurement, using KeNHA as a case study. The descriptive research design of the study separated the 50 respondents into four groups: department heads, all managers, senior procurement officers, and the head of the procurement function. A questionnaire with both closed- and open-ended questions was used by the researcher to collect primary data. Tables and charts were used to present the findings of the SPSS (version 22) analysis of the data. The study discovered that KeNHA's procurement performance is influenced by its quality control system. Planning for quality control, developing quality control policies, implementing quality control practices, and reporting on quality control all affect how effectively KeNHA procures goods and services. The purpose of the current study is to ascertain how a quality management system affects long-term procurement.

Rajab (2015), studied the effectiveness of the supply chain and the quality control practices used by significant Kenyan manufacturers. The study set out to determine three things: the degree to which large-scale manufacturing companies in Kenya use quality management methods; the relationship between these practices and supply chain performance; and the difficulties these companies face. The data were collected using a descriptive study approach, and descriptive statistics were used to analyze them. According to the study, large



manufacturing firms in Nairobi, Kenya, used benchmarking, ISO standards, lean operations, continuous quality improvement, six sigma practices, and supplier collaboration extensively. Positive correlation was found between the independent and dependent variables.

Siongok & Noor (2016) examined the Kenyan State Corporation's effectiveness in carrying out its quality control processes. Analyzing how policies, quality control planning, processes, and reporting impact the procurement performance of State Corporations was one of the study's primary goals. Surveys with both closed- and open-ended questions were the major method the researcher employed to collect data. Along with the pilot study, the data were analyzed and the reliability of the instrument was evaluated. The results of the SPSS (version 22) data analysis were presented using tables and charts. The study concluded that KeNHA's quality control system had an impact on its procurement performance. KeNHA's ability to successfully acquire goods and services depends on a number of factors, including quality control planning, quality control rules development, quality control practices implementation, and quality control reporting.

In Kenyan manufacturing firms Wanyoike (2016), looked into quality management practices and company performance. The study employed both descriptive and explanatory research designs. The target audience consisted of 60 Kenyan manufacturing companies, with a sample size of 120 respondents. The investigation employed the census sample method. The study made use of primary information gathered through self-administered surveys. The study instrument's validity was guaranteed by face and content validity, and the reliability of the instrument was evaluated using Cronbach's Alpha, which yielded an acceptable coefficient of 0.7. Descriptive and inferential statistics were used to analyze the data with the help of SPSS, version 21. The study recommended that management show its commitment to quality by providing quality management practices with a strategic direction that is consistent with the company's aims.

The studies reviewed have sought to establish a direct relationship between quality management systems and its effects on various aspects of performance. Daoud (2021) evaluated the moderating effect on ISO 9001 Certification on the relationship between quality management practices and innovation for 81 firms from the manufacturing sector in Tunisia did not give conclusive results as to the extent which ISO 9001 moderates the relationship between quality management practices and innovation. The current study seeks to determine the moderating effect of quality management systems on the relationship between inbound logistic strategies and sustainable procurement performance among KTDA factories in Kenya.

3.0 RESEARCH DESIGN

A correlation research design was adopted since it respond to questions like "what, who, and how" of a phenomenon (Donald & Pamela, 2006). Insights into current phenomena relating to circumstances, activities, and relationships were gained through this research design (Salaria, 2012). The design calculates the degree to which various variables are related and determine whether and how much there is a relationship between two or more quantifiable variables, (Mugenda & Mugenda, 2003).

Kenya's South Rift Region produces more tea compared to other regions hence the study was undertaken in the entire 16 KTDA region 5 Factories, also known as Kericho Highlands. The region has a high tea production and small-scale farmers expect factories to pay them well for the tea leaves supplied at the end of the month as well as at the end of the year in the form of bonuses. The payout usually varies from year to year and that the amount paid is unique to an individual factory rather than the region as a whole. This has led to more farmers opting to deliver their tea leaves to private as well as multinational tea companies' factories in the region hence a study on inbound logistics and sustainable procurement performance added value to KTDA managed factories.

Production managers, ICT managers, Procurement Managers, Leaf Base Managers, Factory Unit Managers, and Directors in Region 5 KTDA factories in Kenya were the target population. The target population was selected based on their knowledge on the operations of Kenya tea development authority factory in relation to inbound logistic and sustainable procurement performance. Since the target population in the study is manageable the study used census method in that data were collected from all the Production managers, ICT managers, Procurement Managers, Leaf Base Managers, Factory Unit Managers, and Directors drawn from the 16 Region 5 KTDA factories.

4.0 FINDINGS

The study sought to determine the moderating effect of quality management system on the relationship between inbound logistics strategy and sustainable procurement performance among KTDA factories in Kenya. The hypothesis which was tested was:

H₀₁: There is no statistical significant moderating effect of quality management on the relationship between inbound logistics strategy and sustainable procurement performance among KTDA factories, Kenya.



Multiple regression model was used to determine the moderating effect of quality management system on the relationship between inbound logistics strategy and sustainable procurement performance among KTDA factories in Kenya. The findings are presented in Table 1.

Table 1

Model Summary for moderating effect of quality management system on the relationship between inbound logistics strategy and sustainable procurement performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.642 ^a	.412	.394	.70807
a. Predictors: (Constant), Suppliers Sourcing Strategy, Transportation Strategy, Material Handling Strategy, Reverse Logistic Strategy				
b. Quality Management System				

Table 1 revealed that quality management as a moderator on the relationship between inbound logistic strategy indicate by Supplier sourcing strategy, Transportation strategy, Reverse logistic strategy and material handling strategy had positive significant relationship with sustainable procurement performance. The results showed that R Square changed to 41.2% in as a result of the moderator effect of QMS and that change was significant. This implies that quality management system enhances inbound logistics which leads to sustainable procurement performance.

ANOVA analysis was used to test moderating effect of quality management system on the relationship between inbound logistics strategy and sustainable procurement performance. The hypotheses were tested using 5% significant level.

Table 2

ANOVA results for moderating effect of quality management system on the relationship between inbound logistics strategy and sustainable procurement performance

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	57.216	5	11.443	22.824	.000 ^b
Residual	81.722	163	.501		
Total	138.938	168			
a. Dependent Variable: Sustainable Procurement Performance					
b. Predictors: (Constant), Suppliers Sourcing Strategy, Transportation Strategy, Material Handling Strategy, Reverse Logistic Strategy					
c. Quality Management System					

The results from Table 2 on ANOVA revealed that quality management system had a significant moderating effect on the relationship between inbound logistics strategy and sustainable procurement performance ($F_{(5,167)} = 11.443$, $p < 0.05$). The findings showed that the significance value is 0.000 which is less than 0.05. This implies that model was fit for the data.

Table 3

Coefficients results for moderating effect of quality management system on the relationship between inbound logistics strategy and sustainable procurement performance

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.424	0.213		11.356	0.000
	Suppliers sourcing strategy	0.489	0.079	0.654	6.197	0.000
	Transportation strategy	0.344	0.107	0.063	0.409	0.003
	Material handling strategy	0.138	0.086	0.026	0.269	0.304
	Reverse logistic strategy	0.239	0.120	0.112	0.775	0.001
	Quality Management system	0.243	0.063	0.287	3.876	0.000
a. Dependent Variable: Sustainable procurement performance						



As presented on Table 3, it was established that there exists a significant positive relationship between suppliers sourcing strategy and sustainable procurement performance ($\beta = 0.489$, $p < 0.05$). The beta coefficient of 0.489 means that when suppliers sourcing strategy increases by an additional unit, sustainable procurement performance of KTDA factories increases by 0.489. The findings also revealed that there exists significant positive relationship between transportation strategy and sustainable procurement performance ($\beta = 0.344$, $p < 0.05$). The beta coefficient of 0.344 means that when transportation strategy increases by an additional unit, sustainable procurement performance of KTDA factories increase by 0.344.

The findings showed that there exists significant positive relationship between material handling strategy and sustainable procurement performance ($\beta = 0.138$, $p < 0.05$). The beta coefficient of 0.138 means that when material handling strategy increases by an additional unit, sustainable procurement performance of KTDA factories increases by 0.138. The study findings showed that there exists a significant positive relationship between reverse logistics strategy and sustainable procurement performance ($\beta = 0.239$, $p < 0.05$). The beta coefficient of 0.239 means that when reverse logistic strategy increases by an additional unit, sustainable procurement performance of KTDA factories increase by 0.239.

The findings showed that there exists a significant positive relationship between quality management and sustainable procurement performance ($\beta = 0.243$, $p < 0.05$). The beta coefficient of 0.243 means that when quality management increases by an additional unit, sustainable procurement performance of KTDA factories increases by 0.243. From the coefficient of determination findings, the moderator regression model now becomes:

$$Y = 2.424 + 0.489 X_1 + 0.344 X_2 + 0.138 X_3 + 0.239 X_4 + 0.243 X_5 \dots\dots\dots (v)$$

Where Y = Sustainable Procurement Performance, X_1 = Suppliers Sourcing Strategy, X_2 = Transportation Strategy, X_3 = Material Handling Strategy, X_4 = Reverse Logistic Strategy, X_5 = Quality Management System

The study findings agree with Siongok and Noor (2016) who noted that procurement performance is influenced by its quality control system. The study findings contradict Daoud (2021) study which could not establish the extent to which ISO 9001 could influence the relationship between QMS practices and innovation. The study findings disagree with the findings of Ikay & Aslan (2011), who established that there was no statistically significant performance difference between quality management certified organization and noncertified organization was found, according to the results. The study therefore concludes that the hypothesis H_0 : "There is no statistically significant moderating effect of quality management on the relationship between inbound logistics strategy and sustainable procurement performance among KTDA factories, Kenya." is failed to be rejected since the findings showed that there exist a significant moderator effect of quality management System on the relationship between inbound logistic strategy and sustainable procurement performance ($\beta = 0.243$, $p < 0.05$).

5.0 CONCLUSIONS AND RECOMMENDATION

The study concludes that quality management system had a positive significant moderating effect on the relationship between inbound logistics strategy and sustainable procurement performance. The findings conclude that KTDA Factories have adopted quality management system in their procurement processes; KTDA factories quality management system ensures that the management and acquisition of material resources have a significant and direct impact on the quality of the products; KTDA factories follows the total quality concept's guiding principles in its management and purchase of material resources.

The study recommends that KTDA factories should employ quality management system by following total quality concept's guiding principles in the management and purchase of material resources; chose suppliers based on their competence and commitment to sustainability practices and regularly monitor their compliance with regulation.

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