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Outbound Activities and Supply Chain Performance of Tea Factories in Embu County, Kenya

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Abstract

Purpose: The study sought to examine the effect of outbound Activities on the supply chain performance of tea factories in Embu County, Kenya.

Methodology: The study adopted a descriptive research design. The target population comprised 675 staff drawn from three tea factories in Embu County, namely Kathangariri, Rukuriri, and Mungania, including finance officers, supplies officers, technical officers, field officers and production assistants. Using Slovin's formula, a sample size of 251 respondents was obtained. Stratified random sampling was used to ensure proportional representation across the factories. Structured questionnaires containing open-ended, closed-ended, and 5-point Likert scale items were used to collect primary data. Quantitative data was analyzed using SPSS version 26 through descriptive statistics such as means and standard deviations, while inferential statistics including correlation and regression analyses were employed. Results were presented in tables and figures for clarity.

Findings: The findings showed that outbound activities had a significant effect on supply chain performance with a correlation coefficient value (r) of 0.588 and p-value of 0.000 at 95% confidence levels denoted a strong correlation. Supplier profitability was linked to reduced lead times, lower procurement costs, and improved customer satisfaction, while regression results confirmed that financial evaluation positively and significantly influenced procurement performance.

Unique contribution to theory, practice and policy: Theoretically, it advances value chain perspectives by linking financial strength and logistics efficiency to customer satisfaction. Practically, it highlights the need for improved delivery systems, route optimization, and reliable distribution frameworks. From a policy angle, the study supports guidelines on logistics standards and stronger partnerships to enhance outbound supply chains in Kenya's tea sector.

Keywords: *Outbound Activities, Supply Chain Performance, Value Chain Management*

JEL Codes: *L7*

INTRODUCTION

Outbound activities within Value Chain Management (VCM) are critical in shaping the competitiveness and performance of tea factories, particularly in export-oriented economies such as Kenya. Efficient outbound practices including logistics coordination, product diversification, distribution, and market linkages enable factories to meet international quality standards, reduce lead times, and respond effectively to global market dynamics. Globally, tea-exporting countries have leveraged outbound value chain practices to strengthen performance; for instance, China's adoption of digital platforms has enhanced traceability and export responsiveness (Liu et al., 2022), while European markets emphasize stringent traceability and sustainability standards that push factories to adopt advanced logistics and compliance systems (Sodhi & Tang, 2021; Garcia-Torres et al., 2021). In North America, outbound agility, supported by digitalization and certification schemes, has been shown to increase customer trust and improve market share for tea and related beverages (Reid & Dearden, 2020; Chowdhury et al., 2022).

Regionally, African tea-producing countries illustrate the strategic role of outbound activities in performance improvement. Rwanda's modernization of outbound logistics through public-private partnerships has boosted export earnings and elevated global reputation (Hinz & Tschirley, 2019), while Malawi's participation in auction systems and direct trade has improved market access and price realization despite persistent infrastructure challenges (Chipeta & Kachere, 2020). In Kenya, as the third-largest global tea producer, outbound value chain practices remain pivotal, given the industry's reliance on export markets and vulnerability to price volatility, climate change, and high operational costs. Strengthening outbound activities through logistics optimization, export diversification, and improved customer responsiveness therefore represents a strategic pathway for sustaining supply chain performance and securing the long-term competitiveness of Kenyan tea factories in global markets.

Statement of the Problem

Kenya's tea industry contributes significantly to the national economy, accounting for 2% of GDP in 2023 and generating KES 120 billion in export earnings, representing about 26% of foreign exchange income (Tea Board of Kenya [TBK], 2023). The sector sustains over 600,000 smallholder farmers, with Embu County standing out as a key tea-producing region. Despite its importance, the industry faces persistent inefficiencies along the supply chain that undermine competitiveness and farmer earnings (Kimathi et al., 2018; TBK, 2022). Limited adoption of value chain management (VCM) practices has resulted in high operational costs, inconsistent quality, delayed deliveries, and weak integration of value addition. Consequently, average tea prices have declined from KES 40 per kilogram in 2010 to KES 21 in 2024, eroding profitability amid rising input costs (Mbui et al., 2016).

Evidence from earlier studies underscores the importance of VCM and particularly outbound activities in strengthening agricultural supply chains. Emmanuel (2015) demonstrated that weak

linkages among producers, processors, and consumers constrain coordination and performance, while Mbui et al. (2016) associated declining tea factory returns with inadequate farmer training, limited quality control, and minimal value addition. Building on these insights, the present study examines the influence of outbound activities on the supply chain performance of tea factories in Embu County, with a particular focus on addressing existing inefficiencies.

The null hypothesis was structured as follows:

H_o1: There is no significant influence of outbound logistics activities on supply chain performance of tea factories in Embu County.

LITERATURE REVIEW

Theoretical Review

Transaction Cost Economics (TCE), pioneered by Williamson (1985) and rooted in Coase's (1937) theory of the firm, explains organizational choices as efforts to minimize the costs of transactions such as searching, negotiating, monitoring, and enforcing agreements. TCE assumes bounded rationality and opportunism, implying that governance structures are necessary to reduce inefficiencies and risks in economic exchanges. In supply chain contexts, TCE has been widely applied to decisions on vertical integration, channel governance, and inter-firm collaboration (Rindfleisch & Heide, 1997; Ghosh & John, 1999; Cao & Lumineau, 2015). Its relevance to outbound logistics is notable, as activities like warehousing, transportation, and distribution inherently generate transaction costs through coordination with buyers, intermediaries, and logistics providers (Esper & Williams, 2003).

Within Kenya's tea industry, outbound operations are particularly transaction-intensive due to reliance on export markets, auction systems, and multiple intermediaries (Wanjiru & Iravo, 2018). From a TCE perspective, governance choices such as centralized auctions, direct trade contracts, and integrated logistics subsidiaries aim to minimize uncertainty, opportunism, and asset-specific risks while improving responsiveness and profitability (Ng'etich, Korir, & Cheruiyot, 2020; Mwaura & Katuse, 2018). Thus, TCE provides a robust framework for analyzing outbound activities in tea factories, highlighting how governance mechanisms and distribution strategies are shaped by the pursuit of lower transaction costs and enhanced supply chain performance.

Conceptual Framework

The significance of a conceptual framework lies in its ability to ground a study in theory, enhance coherence, and provide a roadmap for data collection and analysis. According to Sale and Carlin (2025), a conceptual framework is essential for contextualizing research within existing knowledge and for ensuring that findings are interpreted meaningfully. In this study, outbound activity was the independent variable and supply chain Performance of tea factories was the dependent variable as depicted below.

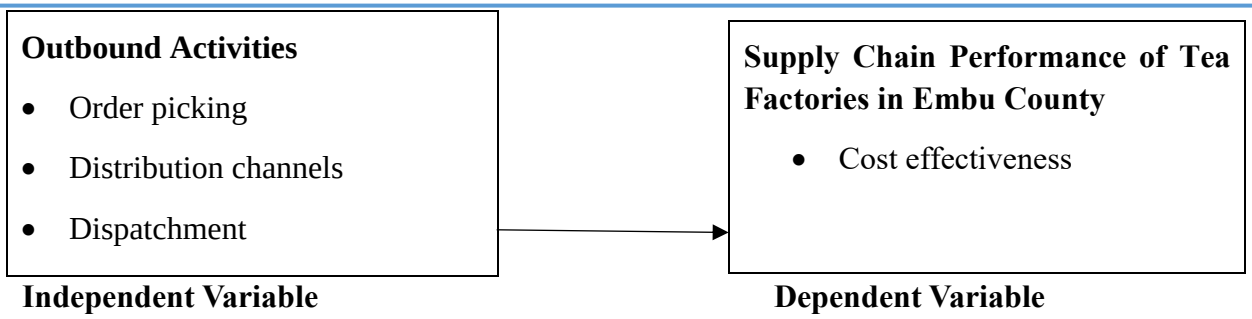

Figure 1: Conceptual Framework

Empirical Review

Outbound activities, including transportation, warehousing, and distribution, have been consistently linked to supply chain performance. Muiruri, Shale, and Osoro (2025) found that large manufacturing firms in Kenya achieved improved delivery times and reduced distribution costs through effective transportation management, underscoring the role of outbound logistics in lowering operational inefficiencies. Similarly, Mbugua, Ngugi, Thogori, and Mwangi (2024) reported that efficient outbound logistics practices such as order processing, dispatch, and transport to customers enhanced sales performance in food and beverage manufacturing firms, demonstrating the contribution of structured outbound systems to market responsiveness.

Within the Kenyan tea sector, Matuga, Simba, and Kisingu (2019) observed that product diversification and process management activities tied closely to outbound flows significantly boosted performance, highlighting the importance of efficient export and market-oriented practices. Evidence from floriculture exporters by Onyiego and Osoro (2022) showed that investments in logistics infrastructure and electronic procurement reduced delays and strengthened firm outcomes, while Mbithe and Lambaino (2018) demonstrated that ICT tools such as e-procurement, EDI, and ERP systems enhanced distribution management in cement firms.

Further, Boarteng (2021) emphasized that efficient distribution channels and logistics in Ghana's cocoa value chain improved profitability and global competitiveness. A more recent study by Aslam, Waseem, Muneeb, Ali, & Roubaud (2023) showed that within Pakistani manufacturing firms, customer integration enabled through market orientation and supply chain strategy significantly improved responsiveness and cost efficiency, underscoring the impact of outbound/integrative practices in modern value chains. Collectively, these studies affirm that outbound practices whether through logistics optimization, technological integration, or market-focused diversification are pivotal for strengthening supply chain performance, particularly in export-driven industries.

RESEARCH METHODOLOGY

This study adopted a descriptive research design, which was suitable for collecting detailed information on how value chain management influences supply chain performance in tea factories

(Hancock et al., 2021). The target population comprised 675 staff from Kathangariri, Rukuriri, and Mungania tea factories in Embu County, including finance officers, supplies officers, technical officers, field officers and production assistants. Using Slovin's formula at a 5% margin of error, a sample size of 251 respondents was obtained. Stratified random sampling was applied to finance officers, supplies officers, technical officers, field officers and production assistants to ensure fair representation from each factory.

Table 1: Sample Size

Tea Factories/ Unit of Observation	Kathangariri Tea Factory	Rukuriri Tea Factory	Mungania Tea Factory	Total Employees
Supplies Officers	11	21	19	51
Finance Officers	12	10	9	31
Technical officers	7	8	8	23
Field Officers	28	35	30	94
Production assistants	14	20	19	53
Total	**73**	**94**	**85**	**251**

Primary data was collected using a structured questionnaire comprising both open- and closed-ended questions, which allowed standardized and timely responses (Harris & Brown, 2010). Research authorization was obtained from Meru University of Science and Technology and NACOSTI before administering the questionnaires. A pilot test involving 25 respondents at Githongo Tea Factory, representing 10% of the sample, was conducted to assess the suitability of the instrument (Saunders, Lewis, & Thornhill, 2019). Expert review further enhanced content validity. The collected data was coded and analyzed using SPSS version 26. Descriptive statistics such as means, percentages, and standard deviations were used to summarize the data, while inferential analysis, including regression, was applied to establish the relationship between value chain management practices and supply chain performance. Results were presented using tables for clarity.

RESEARCH FINDINGS AND DISCUSSIONS

Table 2: Response Rate

Item	Frequency	Percentage
Distributed questionnaires	251	100
Completed and returned questionnaires	203	80.9
Un returned questionnaires	48	19.1

A total of 203 questionnaires were filled out of the expected 251, translating to 80.9%. The response rate was representative and adequate for analysis for the purpose of making conclusions and generalizing the research's findings. This aligns with the observation of Musau and Wachiuri (2024), who noted that in social science research, a response rate above 50% is considered sufficient for data analysis and reporting. Similarly, Johnson et al. (2023) emphasized that response rates exceeding 60% are generally acceptable for empirical studies in the social and behavioral sciences.

Descriptive Analysis Outbound Activities

The study collected respondents' views on different aspects of outbound activities and their influence on supply chain performance. Participants were asked to rate statements reflecting the application of outbound activities in tea factories within Embu County using a five-point Likert scale, where 5 represented Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, and 1 = Strongly Disagree.

Table 3: Outbound Activities Descriptive Results

Statements	N	Mean	Std Dev
The tea factory accurately fulfills orders with minimal errors in picking.	203	4.19	0.782
The tea factory's order picking process is efficient and timely.	203	4.13	0.804
The tea factory effectively uses its distribution channels to reach its market.	203	3.94	0.896
The tea factory regularly evaluates and optimizes its distribution channels.	203	3.93	0.783
The tea factory ensures timely dispatch of orders to customers	203	3.90	0.912
The tea factory's dispatch process is reliable and meets delivery schedules.	203	3.86	0.962
Average Score		**3.99**	**0.857**

On the statement that the tea factory accurately fulfills orders with minimal errors in picking the mean was 4.19 and a standard deviation 0.782. On the opinion that the tea factory's order picking process is efficient and timely registered a mean of 4.13 and a standard deviation of 0.804. respondent's opinions on the item the tea factory regularly evaluates and optimizes its distribution channels scored a mean of 4.13 and a standard deviation of 0.804. Further, on the statement that the tea factory effectively uses its distribution channels to reach its market a mean of 3.94 and a standard deviation of 0.896. On the opinion that the tea factory ensures timely dispatch of orders to customers, a mean of 3.90 and a standard deviation of 0.912 was registered. Lastly, the statement that the tea factory's dispatch process is reliable and meets delivery schedules had a mean of 3.86 and a standard deviation of 0.962. These observations are consistent with findings by Nyaga,

Ismail, and Nteere (2021), who demonstrated that effective order fulfillment characterized by prompt packing and delivery positively and significantly influences performance in manufacturing firms in Nairobi. Additionally, Chesesio and Makokha (2020) found that robust distribution channel management significantly enhances supply chain performance by ensuring delivery efficiency and customer satisfaction. Together, these studies suggest that while the tea factory excels in precise order picking, bolstering the performance and evaluation of distribution and dispatch mechanisms could further strengthen overall supply chain effectiveness.

Further, the respondents were asked to suggest on aspects to be worked on to achieve customer satisfaction through outbound activities. The findings of the study showed that 45.3% of the respondents indicated working on outbound activities will result to customer satisfaction. Further, 29.6% of the respondents affirmed offering personalized services yield customer satisfaction, while a tie of 25.1% of respondents agreed that timely resolution of issues better yield customer satisfaction in their firms. This aligns with Kimutai and Kilika (2018), who found that responsiveness particularly the speed and effectiveness of addressing customer concerns was a key determinant of satisfaction in Kenyan agribusiness firms. Similarly, Njihia and Wambugu (2020) observed that personalization of services, coupled with proactive communication, significantly strengthened customer loyalty and repeat business in Kenyan manufacturing enterprises. These studies reinforce the present results by indicating that prioritizing quick issue resolution while maintaining personalized and proactive service approaches is essential for enhancing customer satisfaction in the tea sector.

Supply Chain Performance of Tea Factories in Embu County

Table 4: Opinion of the respondents on the various aspects of supply chain performance of tea factories in Embu County

Statements	N	Mean	Std. Dev
The tea factory's supply chain operations are cost-effective, minimizing unnecessary expenses.	203	4.22	0.869
The tea factory strategically manages its supply chain to achieve cost savings.	203	4.08	0.886
The tea factory's supply chain quickly adapts to changes in demand or market conditions.	203	3.97	0.887
The tea factory has a flexible supply chain that can handle unexpected disruptions.	203	3.93	0.895
The tea factory's supply chain strategies significantly contribute to customer satisfaction.	203	3.91	0.902
The tea factory prioritizes customer needs throughout its supply chain processes.	203	3.84	1.075
Average Score		**3.99**	**0.758**

From the table above the opinion the tea factory's supply chain operations are cost-effective, minimizing unnecessary expenses had a mean of 4.22 and a standard deviation of 0.869 while the statement the tea factory strategically manages its supply chain to achieve cost savings denoted a mean of 4.08 and a standard deviation of 0.886. On the opinion the tea factory's supply chain quickly adapts to changes in demand or market conditions a mean of3.97 and a standard deviation of 0.887 was registered. In regards to the opinion the tea factory has a flexible supply chain that can handle unexpected disruptions, a mean of 3.93 and a standard deviation of 0.895 was registered. Further, on the opinion the tea factory's supply chain strategies significantly contribute to customer satisfaction, a mean of 3.91 and standard deviation of 0.902 registered. Lastly, the statement the tea factory prioritizes customer needs throughout its supply chain processes, had a mean of 3.84 and a standard deviation of 1.075. This suggests that while customer satisfaction is acknowledged, its strategic implementation may be inconsistent or not yet deeply embedded. This observation resonates with Ayuma's (2023) findings, which emphasize that information sharing and supplier relationship integration significantly influence customer responsiveness and service quality but require deliberate coordination and trust-based supplier relationships to be effective.

The findings of the study showed that 42.9% of the respondents indicated continuous improvement can boost productivity. Further, 29.6% of the respondents affirmed continuous improvement will help in cost reduction, while a tie of 27.6% of respondents agreed that continuous improvement can help improve customer satisfaction in their factories. This is consistent with Muchiri and Muchemi (2019), who found that continuous improvement practices such as lean production, process optimization, and employee-driven innovation significantly enhance operational productivity in Kenyan manufacturing firms. Similarly, Kihoro and Ndegwa (2017) reported that embedding continuous improvement into operational strategies leads to both cost savings and improved service delivery, ultimately boosting customer satisfaction in agribusiness supply chains. These studies reinforce the present results by suggesting that continuous improvement not only drives efficiency and reduces costs but also strengthens competitiveness through improved customer outcomes.

Further, the respondents were asked whether continuous improvement of chain management practices will positively influence supply chain performance in tea factories. The findings of the study showed that 42.9% of the respondents indicated continuous improvement can boost productivity, 29.6% of the respondents affirmed continuous improvement will help in cost reduction, while a tie of 27.6% of respondents agreed that continuous improvement can help improve customer satisfaction in their factories. This is consistent with Muchiri and Muchemi (2019), who found that continuous improvement practices such as lean production, process optimization, and employee-driven innovation significantly enhance operational productivity in Kenyan manufacturing firms. Similarly, Kihoro and Ndegwa (2017) reported that embedding continuous improvement into operational strategies leads to both cost savings and improved service delivery, ultimately boosting customer satisfaction in agribusiness supply chains. These

studies reinforce the present results by suggesting that continuous improvement not only drives efficiency and reduces costs but also strengthens competitiveness through improved customer outcomes.

Correlation Analysis

Correlation coefficients, according to Saunders et al. (2009), allow a researcher to evaluate the strength of a linear link between two or more variables. As composed by Rubin and Babbie (2010), the value [size] of the absolute value indicates the degree [strength] of correlation whereby (r = .1 to .29 Low; r = .30 to .49 Moderate; r = .5 to 1.0 Large). For this study, Pearson product moment correlation was used to determine the strength and direction of the linear relationship between the independent and dependent variables, and the results are summarized below.

Table 5: Pearson Product Moment Correlation on outbound activities

Variable		Outbound Activities	Supply Chain Performance
Outbound activities	Pearson Correlation	1	0.588
	Sig. (2-tailed)		0.000
	N	203	203
Supply chain performance	Pearson Correlation	0.588	1
	Sig. (2-tailed)	0.000	
	N	203	203

The results show that the correlation between outbound activities and supply chain performance had an r of 0.588 and p-value of 0.000 at 95% confidence levels. Therefore, the coefficient value was between 0.5 to 1.0 and this denoted a strong correlation between inbound activities and supply chain performance hence variables are related. These findings align with the observations of Mbithe and Lambaino (2018), who noted that modern distribution management practices significantly enhanced firm performance, and with Onyiego and Osoro (2022), who emphasized the role of strategic logistics in improving efficiency and competitiveness. Similarly, Boarteng (2021) found that effective distribution and customer linkages strengthened profitability and competitiveness in the Ghanaian cocoa value chain. Collectively, these studies underscore that outbound activities are central to ensuring agility, responsiveness, and customer satisfaction in supply chain performance.

Regression Analysis

Regression analysis provides a way to measure both the direction and intensity of relationships, enabling evidence-based decision-making and reliable prediction. Beyond determining which variables have a significant effect, it also indicates the magnitude of their impact (Biçer, 2023).

Table 6: Model Summary on Outbound Activities and Supply Chain Performance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.588	.346	.343	3.563

a. Predictors: (Constant), outbound activities

The results of the study showed that the correlation of coefficient (R) was 0.588, the coefficient of determination (R2) was 0.346 and the adjusted R square was 0.343. Therefore, correlation of coefficient showed that outbound activities had a strong and positive association with the supply chain performance that translated to 38.7%. of. Further, the correlation of determination showed that the independent variable (out bound activity) accounted to 34.6% of variations on supply chain performance. Lastly, the adjusted R square signified that factoring in other predictor variables in the study, outbound activities accounted to 34.3% of variations on supply chain performance in the tea factories in Embu County. These findings align with Aslam, Waseem, Muneeb, Ali, & Roubaud (2023), who highlighted that strong distribution and customer collaboration enhance responsiveness, and with Choudhary and Shankar (2021), who found that resilient outbound strategies improved performance during supply chain disruptions.

Table 7: ANOVA on Outbound Activities and Supply Chain Performance

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1351.135	1	1351.135	106.454	0.000[b]
	Residual	2551.121	201	12.692		
	Total	3902.256	202			

a. Dependent Variable: supply chain performance
b. Predictor: (Constant), outbound activities

The regression results of ANOVA indicated an F-statistic of 106.454 which was significant at 5% significance level (p-value 0.000<0.05). The null hypothesis H03: There is no significant influence of outbound logistics activities on supply chain performance of tea factories in Embu County was therefore, rejected and the study arrived at a conclusion that model summary of the independent variable was significant at 5% significance level. Similarly, Koskei (2023) emphasized that in Kenyan manufacturing firms, effective outbound practices strengthen resilience and competitiveness. Mwangi and Ouma (2022) also highlighted that efficient outbound activities,

particularly in the horticultural export sector, are critical for achieving customer satisfaction and sustaining global market presence.

Table 8: Regression Coefficient of outbound activities and supply chin performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	10.909	1.276		8.550	.000
	Outbound Activities	.549	.053	.588	10.318	.000

a. Dependent Variable: supply chain performance

The results of the study showed a regression equation $Y=\alpha+\beta_3X_3+\varepsilon$ that expounded to $Y=10.909+0.549X_3+\varepsilon$. This denoted that ceteris paribus, supply chain performance had a constant of 10.909 implying that, there exist other independent variables that result to variations in supply chain performance other than the study variable (outbound activities). The regression results showed that outbound activities had a statistically significant effect on supply chain performance (p-value 0.000<0.05). Holding other factors constant, a unit change in outbound activities would lead to change in supply chain performance by 0.549 units.

CONCLUSION AND RECOMMENDATION

The study established that outbound activities have a significant and positive effect on the supply chain performance of tea factories in Embu County. Correlation analysis revealed a moderately strong and statistically significant relationship ($r = 0.588$, $p < 0.05$) between outbound activities and supply chain performance, while regression analysis indicated that 34.6% of the variation in supply chain performance could be explained by outbound practices. The regression coefficient further confirmed that improvements in outbound logistics directly enhance performance outcomes. These findings underscore that practices such as timely order processing, efficient transportation, effective distribution systems, and structured delivery schedules are critical drivers of efficiency, customer satisfaction, and competitiveness in the tea sector.

Based on these findings, the study recommends that tea factories in Embu County strengthen outbound logistics by streamlining transportation networks and adopting real-time tracking technologies to ensure timely delivery of products. Factories should develop structured distribution schedules, enhance order fulfillment systems, and establish stronger communication channels with customers to reduce delays and improve reliability. Investment in modern fleet management systems and partnerships with logistics service providers should also be considered to optimize transportation efficiency. Additionally, management should prioritize continuous training for staff involved in outbound logistics to enhance their capacity in handling dynamic customer needs and emerging challenges. By improving outbound operations, tea factories can achieve greater

operational efficiency, build stronger customer trust, and sustain long-term competitiveness in the industry.

Areas for Further Research

This study was limited to tea factories in Embu County, and therefore the findings may not be fully generalizable to other regions or sectors. Future research should focus on examining supplier development, integration, and capacity-building initiatives in strengthening inbound logistics across agricultural value chains, including horticulture, dairy, and cereals. In addition, broadening the study to other regions and to industrial or service-based supply chains such as healthcare, education, and logistics would provide comparative insights. Such studies would help to identify sector-specific drivers and challenges in the adoption of value chain management practices and contribute to evidence-based policy and strategic interventions aimed at enhancing supply chain performance across Kenya's economy.

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