African Journal of Emerging Issues
Peer reviewed | Double blind | Interdisciplinary

African Journal of Emerging Issues (AJOEI)
Online ISSN: 2663 - 9335
Available at: https://ajoeijournals.org

PROCUREMENT AND SUPPLY CHAIN

GREEN SUPPLY CHAIN MANAGEMENT AND PERFORMANCE OF FOOD AND BEVERAGES MANUFACTURING FIRMS IN KENYA

[1]*Regina Njeri Ngatia, [2]Dr. Anthony Osoro & [3]Dr.Samson Paul Nyang'au

[1]Ph.D. Candidate, School of Business and Entrepreneurship, Jomo Kenyatta University of Agriculture and Technology, Kenya.

[2&3]Lecturer, School of Business and Entrepreneurship, Jomo Kenyatta University Agriculture and Technology

Corresponding email: njeringatia2015@gmail.com

Publication Date: July 2024

ABSTRACT

Purpose: The objective of this study was to assess the impact of green supply chain management on performance of food and beverages manufacturing companies in Kenya.

Methodology: The study utilized a cross-sectional survey approach, focusing on senior procurement managers from 246 food and beverage firms in Kenya. A basic random sampling design was employed, resulting in a sample size of 150 senior supply chain managers. Data were collected through self-administered and semi-structured questionnaires. The data were analyzed using descriptive and inferential statistics, including regression analysis, correlation, and hypothesis testing. SPSS version 28 was used for data processing, and the results were presented in tables.

Results: The study found a statistically significant positive relationship ($R = .526$, $p = .000$) between green supply chain management and the performance of Kenyan food and beverage manufacturing companies, with green supply chain management accounting for 27.6% ($R^2 = .276$) of the performance variance.

Unique contribution to theory, practice and policy: The study emphasizes the need for food and beverage manufacturing managers to adhere to green supply chain management protocols to enhance performance.

Keywords: *Green supply chain management, performance, Green purchasing, Green logistics, Green packaging, Green design*

INTRODUCTION

To ascertain the magnitude of supply chain practices that nurture the attainment and promotion of an eco-conscious perspective, Green Supply Chain Management (GSCM) entails environmental aspects (Vanalle et al., 2017). Rohrich et al. (2017) agreed that GSCM is the contemporary interpretation of traditional supply chain procedures, incorporating various actions aimed at reducing environmental impact. These activities encompass green purchasing, eco-friendly design, resource preservation, reduction of hazardous material usage, and product recycling, among others. Green processes, as delineated by Kumar et al. (2015), encompass four primary categories: core reconditioning and disposal, green manufacturing, green logistics, and green design. These categories form the pillars of GSCM, an organizational framework that has gained prominence. GSCM is dedicated to enhancing environmental efficiency while simultaneously reducing costs. Its overarching goal is to fulfill company objectives such as growth, efficiency in processes, and customer satisfaction, all while managing its environmental impact with careful consideration, as highlighted by Govindan et al. (2014).

Numerous investigations have looked into how GSCM procedures affect a company's operational, environmental, and financial performance. Previous research findings on the persuasion of GSCM in supply chain networks, primarily in poor nations, had shown inconsistent results on the firm's economic performance (Vijayvargy *et al.,* 2017). Researchers have focused a lot of emphasis on GSCM in an effort to lower environmental risks and improve sustainability. Thus, it has been defined by incorporating environmental factors into all stages of supply chain process from designing products to sourcing materials, testing, production, delivering goods to customers and finally disposing of them when their useful lives are coming to an end (Chygryn *et al.,* 2020). Research in the present day has given emphasis to the novel idea of GSCM. But in the body of research on environmental supply chains that is currently available, it has gotten little attention, despite its significance to business (Pomegbe *et al.,* 2019).

There is a shortage of natural resources, and manufacturing companies face difficulties managing waste and adhering to environmental laws and standards. Watershed discharge into the ocean affects the surrounding ecology, impacting productivity, biodiversity, and system performance (NEMA, 2018). There is tremendous demand on manufacturing companies to increase environmental sustainability while also enhancing efficiency

(Ahmad, 2015). Green procurement, packaging, and shipping practices can minimize and eliminate pollution, allowing industrial companies to improve performance goals such as responsiveness, dependability, and cost reduction. Green approaches reduce pollution, increase reliability, and maximize resource use (Amiyeh et al., 2018). Eshikumo (2017) suggests that due to cost reduction and reliability-enhancing effects, greening supply chain management positively correlates with performance

Statement of the Problem

Food and beverages firm have been experiencing problems, according to Zhou, Ayegba, Ayegba, Ayegba, and Xin Jie (2021) in Nigeria food and beverages firm had performance challenges leading to decreased sales and competition. The incorporation of environmentally friendly criteria into supplier selection and product sourcing decisions is impeded by Kenyan food and beverage manufacturing companies' poor adoption of green procurement methods (Onditi, 2020). Moreover, Kenyan food industry have noticed a decline in profitability throughout their operations and production, this is due to supply chain disruptions brought on by concerns about food safety, shortage of supply, rising prices leading to customer dissatisfaction (Muthoni & Mose, 2019).

A study on freight management and performance of food and beverage manufacturing firms in Kenya revealed that firms uphold fleet aspects that reduce lead time but failed to focus on those that enhance the customer satisfaction and this perhaps usher to poor performance (Jepchumba, Ngugi, Odhiambo and Shale,2022). Kiiru and Ogutu (2017) alluded that the challenge facing Kenyan food and beverage manufacturing companies is developing and putting into practice a strong framework for green supply chain management. This framework should strategically integrate sustainable packaging solutions, green procurement practices, and effective reverse logistics processes within Kenya's manufacturing sector in order to reduce environmental impact, improve resource management, and promote sustainability while retaining excellent performance.

Kenya's manufacturing sector's contribution to GDP has been dropping, as seen by its pitiful 5.4% GDP contribution in 2020, 4.3% GDP contribution in 2019, 7.5% GDP contribution in 2021 and failed to meet projected 15% by 2022 (AEU, 2022). Moreover, Kenyan food and beverage firms face vulnerability to supply chain disruptions and challenges attributable to inefficiencies with both internal and external supply chains, as

noted by Mideva & Moronge, (2019). Furthermore, according to earlier research as suggested by (Mosbei Bor, Ngugi, and Odhiambo, 2021), on green supply chain management it pointed out that environmental considerations and quality impact performance issue. Similar research had been done but with a limitation in the regional perspective. In Kenya, Thiga, Chege, & Arani (2023) did green procurement and performance of food and beverages manufacturing firms in Kenya but narrow it on green procurement policies, participation in green procurement workshops/seminars and supplier involvement on performance. This is proofed because the Kenyan G.D.P. futile to meet its aims, which meant that the problem persisted. Thus, the purpose of the current research was to examine the influence of green supply chain management on performance of food and beverages manufacturing firms in Kenya.

LITERATURE REVIEW

This section presents reviewed empirical literature relating to the subject. The literature has been organized based on green supply chain management, performance, financial perspectives, internal business perspectives, organizational learning and customer perspectives. These sections are detailed as follows:

Green Supply Chain Management

Diab, AL-Bourini, and Abu-Rumman (2015) investigated the impact of green supply chain techniques on organizational performance. Their study focused on consumer cooperation, eco-design and packaging, green purchasing, and green warehousing. Eco-design involves using less material and energy, packaging focuses on recyclable and reusable materials, green purchasing minimizes waste and promotes environmentally friendly products, and green warehousing adopts safe and appropriate storage practices.

Nderitu and Lelei (2016) examined the effectiveness of green supply chain management in Kenyan food and beverage companies. They identified green supplier evaluation, reverse logistics, adoption of green technology, and corporate social responsibility as key facets. The study found that these factors improved performance through recycling, green manufacturing, green refurbishing, and reducing pollution and greenhouse gas emissions.

Further, Sarhaye and Marendi (2017) explored the benefits for Kenyan manufacturers adopting green procurement, return management, and environmentally friendly packaging.

Green procurement practices impacted performance across manufacturing, packaging, marketing, and reverse logistics by minimizing resource use, promoting recycling, and eco-labeling goods (Achuora, 2018). The adoption of these practices was found to enhance overall efficiency and sustainability.

Moreover, Muasya and Kihara (2018) found that eco-design manufacturing, green packaging, waste management systems, and material sourcing significantly and favorably impacted performance. This was achieved through the use of fuel-efficient vehicles, standardized packaging, reusable labels, and efficient route planning. These practices collectively contributed to reduced environmental impact and improved operational efficiency.

Additionally, Sukortpromme and Onputtha (2019) examined the impact of environmentally friendly sourcing, manufacturing, distribution, and marketing practices on performance. They found that certified items, reverse logistics, eco-design products, and recycling significantly influenced performance. These green practices helped in enhancing sustainability and reducing costs.

Ochieng (2019) investigated the effects of reverse logistics, energy-saving equipment purchases, and recyclable goods on performance. The study highlighted the contributions of refilling, using renewable energy sources, and effective waste management. These initiatives were found to improve operational efficiency and reduce environmental impact.

According to Jassim, Al-Mubarak, and Hamdan (2020), green purchasing, manufacturing, and marketing significantly improved performance, while green packaging had no effect and green design had a negative impact. Abbas and Hussein (2021) indicated that green management, green environments, and green food greatly impacted performance. These findings suggest a varied impact of different green practices on organizational performance.

Likholo and Senelwa (2022) studied the effect of green procurement on performance at Delmonte Company Limited in Kenya. They focused on supplier assessment, eco-design practices, e-procurement, and reverse logistics. Supplier assessment emphasized biodegradable packaging, eco-design products included green manufacturing, reverse

logistics ensured waste disposal and returns, and e-procurement involved e-sourcing and e-invoicing.

Finally, Nyariaro and Chirchir (2017) found that a green supply chain improved performance through strategies such as using recyclable materials, energy-efficient equipment, reverse logistics, reusing materials, and purchasing ISO-certified products. These strategies collectively contributed to enhanced sustainability and operational efficiency. The study highlighted the importance of adopting comprehensive green supply chain practices.

Performance

According to Ratnaningrum, Aryani, and Setiawan (2020), the balance score card is an essential instrument for performance monitoring and management. A BSC is a performance measuring tool that businesses use to set priorities for their projects, services, and goods, meet their goals, and schedule their daily activities, according to Daft (2015). With the use of the BSC, businesses may track and assess the effectiveness of their blueprint to ascertain their overall performance. Based on four performance perspectives: financial, internal business, learning and growth and customer the BSC is a structured report that evaluates the company's outcomes and goals (Balaji et al., 2021; Pierce, 2022). These four viewpoints are crucial for putting strategy into practice and are also used to assess a company's performance (Camilleri, 2021).

Financial Perspective and Performance

A study by Lesakova, Dubcova, and Gundova, (2017) founded a strong financial perspective in balanced scorecard (BSC) significantly impacts business, by being and securing stable funding is crucial for executing a successful long- term strategy. The firm's ability to increase its capacity to operate in a dynamic and turbulent environment is steered by financing considerations. According to Lesakova et al. (2017), a company can execute its strategy for maintaining performance if it has a thorough focus on finance and makes sure that it is in alignment with having a stable source of funding. The profitability-related metrics are the main emphasis of the financial perspective. Consequently, managers ought to design ways to guarantee financial prosperity by implementing precise and punctual funding tactics (Hamdy, 2018). Fadel, Necib, Rouaski, Challal, and Bouaicha (2021) confirmed that managers can attain a financial viewpoint by guaranteeing lower costs,

boosting market expansion, raising sales revenue, and increasing return on invested capital, all of which contribute to superior performance.

Internal business process internal business process and performance

A company's internal business processes have an impact on a number of elements, including personnel productivity and skill levels, which are key factors in achieving performance. While investigating the efficacy of internal business processes, Benkova, Gallo, Balogova, and Nemec (2020) found that internal business processes should be evaluated in light of a company's capacity as well as how they relate to the strategic objectives of the organization. According to Erawan (2020), internal business processes are a crucial component of business-to-stockholder (BSC) strategy that establishes a company's capacity for effective and seamless customer service and shareholder- and customer-serving operations.

Organizational Learning and growth and performance

Businesses should focus on developing staff capacities to ensure employee happiness, staff retention, and staff training to improve performance in order to sustain their development and innovation (Ahmad & Atieh, 2016). The learning and growth perspective evaluates how well information systems (networks, systems, and databases) function, how well employees (talents, skills, training, and knowledge), and how well company alignment (culture, alignment, leadership, and teamwork) supports the achievement of organizational goals. Processes can only be successful if workers are sufficiently qualified and driven, have access to timely and accurate information, and are led by an effective leader who can produce and deliver high-quality services and goods (Hamdy, 2018). As per the findings of Frederico, Garza-Reyes, Derby, and Kumar (2020), a company's ability to learn and grow results in compliance with legal standards and appropriate leadership engagement and coordination effectiveness. Innovation helps businesses to produce new, higher-quality products that add value for their clients. performance-enhancing knowledge integration through inter-firm partnerships that facilitate knowledge exchange. According to Bach, Klincar, Aleksic, Jelavic, and Zeqiri (2023), implementing mission-driven processes, rewarding systems, and business research has led to a better awareness of client needs and an ability to adapt to a changing corporate environment.

Customer Perspective and performance

In order to successfully tap into the rapidly expanding markets, it is imperative to prioritize the demands of the client by improving the quality of services and products, on time delivery and total devotion on meeting customers' needs (Fatima & Elbanna, 2020). According to Sarraf and Nejad (2020), a company's client focus is considered to be its most important component and should receive all of its attention. Furthermore, managers that possess customer perception are able to develop strategies that are tailored to the requirements and customer projections, which enhances customer retention and satisfaction (Madsen et al., 2019). The primary category for measuring consumer outcomes, according to Lim et al. (2021), is general and comprises customer profitability, market share, customer acquisition, customer retention, and customer satisfaction.

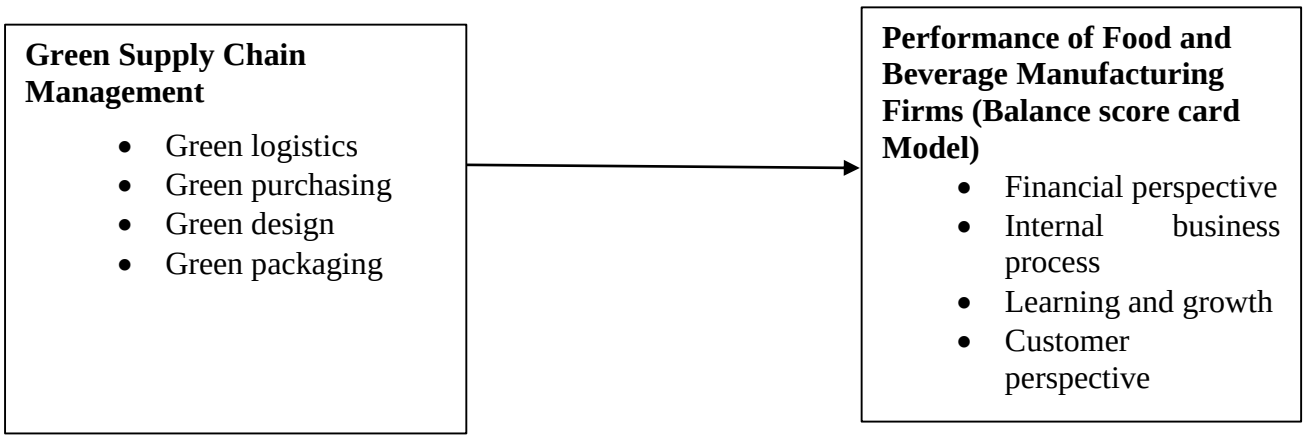

Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

To investigate, the study used a cross-sectional survey. The survey included senior procurement managers from 246 Kenyan companies that manufacture food and beverages. Using a basic random sampling design, 150 senior supply chain managers made up the sample size. A pilot study with a 10% sample size was conducted; 15 questionnaires were sent out, but only 13 were returned. To ascertain the research instrument's adequacy, analysis was conducted. Reliability and validity were also examined. Every variable was over the alpha criterion, which was more than 0.7. Primary data were gathered via self-administration and semi-structured questionnaires. 135 questionnaires were given to

responders and only 119 were returned. Descriptive statistics were used to evaluate the data, which were then processed using SPSS version 28. A focus on regression analysis, correlation, and hypothesis testing was used in the inferential study. Tables were used to display the results.

RESULTS AND DISCUSSIONS

The findings of the study are presented per objective. They have been discussed in the corresponding sections.

Descriptive Analysis of Green supply chain management

Table 1 shows the examination of the impact of different green supply chain management parameters on the performance of food and beverage manufacturing firms. A significant portion, 94.1% of respondents, agreed that businesses efficiently consume less fuel, with a mean score of 4.3361 and a standard deviation of 0.6145. Similarly, 98.3% of respondents agreed that storage equipment uses less energy, with a mean score of 0.4605, a standard deviation of 0.5243, skewness of -0.792, and kurtosis of -0.619. However, 65.6% of respondents indicated that their organizations don't buy certified products, leading to a mean score of 2.1429 and a standard deviation of 0.7511. Furthermore, 65.5% of respondents noted that businesses do not select suppliers based on the availability of environmentally friendly products, resulting in a mean score of 2.3277 and a standard deviation of 0.7714.

Moreover, 79% of participants confirmed that the products are packaged using biodegradable materials, with a mean score of 4.3866 and a standard deviation of 0.8142. Additionally, 94.9% of respondents agreed that the business uses reusable and recyclable packaging, with a mean score of 4.3445 and a standard deviation of 0.6028. Meanwhile, 55.5% of respondents had a neutral opinion about whether the companies provide eco-design items, with a mean score of 3.1681 and a standard deviation of 1.1223. Lastly, 57.2% of respondents believed that businesses have adopted eco-innovative techniques in product creation, with a mean score of 3.5546 and a standard deviation of 1.2330.

These findings align with Diab, AL-Bourini, and Abu-Rumman's (2015) assertion that a green supply chain includes eco-designing products, reducing energy usage, and using packaging that is recyclable, reusable, and disposable to boost output. Additionally, the results support Sukortpromme and Onputtha's (2019) observation that green supply chain management significantly enhances supply chain performance concerning certified

products, recycling, reverse logistics, and eco-design items. Hussein (2021) further discovered that GSCM has a significant and positive effect on performance.

Table 1: Descriptive Statistic on Green Supply Chain Management Parameters on Performance

Green Supply Chain statements	SD	D	N	A	SA	Mean	Std Dev
The firm effectively use less fuel consumption	0.0%	0.8%	5.0%	53.8%	40.3 %	4.3361	.6145
Storage equipment's uses less energy	0.0 %	0.0%	1.7%	36.1%	62.2 %	4.6050	.5243
The firm procure certified products	21.0 %	44.5 %	33.6 %	0.8%	0.0%	2.1429	.7511
Firm base their supplier selection on environmentally friendly products	10.1 %	55.5 %	26.1 %	8.4%	0.0%	2.3277	.7714
Products are wrapped with biodegradable packaging materials.	0.0 %	0.0%	21.0 %	19.3%	59.7 %	4.3866	.8142
Firm cooperate with recyclable and reusable package	0.0 %	0.8%	4.2%	54.6%	40.3 %	4.3445	.6028
Firm produce eco-design products	9.2 %	9.2%	55.5 %	7.6%	18.5 %	3.1681	1.1223
Firm has embraced eco-innovative processes in product development	9.2 %	9.2%	24.4 %	31.1%	26.1 %	3.5546	1.2330

Correlation Analysis for Green Supply Chain management

The study revealed Pearson correlation coefficient of 0.526 at significant level of 0.000 indicating a significant and positive linearity between green supply chain management and performance of Kenyan companies that manufacture food and beverages

Table 2: Pearson Product-Moment Correlations Between Green Supply Chain Management (GSCM) & Performance (P)

Variable		P	GSCM
Performance	Pearson Correlation	1.000	
	Sig. (2-tailed)		
	N		
Green Supply Chain Management	Pearson Correlation	.526**	1.000
	Sig. (2-tailed)	.000	

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

Regression Analysis for Green Supply Chain Management

Regression analysis was conducted to investigate the impact of green supply chain management on the performance of Kenyan food and beverage manufacturing companies. The hypothesis examined was: Ho1: The performance of Kenyan food and beverage manufacturing companies is not significantly impacted by green supply chain management. The results from Model 1 in Table 2 indicate a favorable correlation between the success of these companies and their green supply chain management practices ($R = 0.526$, $R^2 = 0.276$, $F(1,119) = 44.653$, $p = .000$). With an R value of 0.526, green supply chain management accounted for 52.6% of the variation in the performance of food and beverage manufacturing firms.

Table 3: Green Supply Chain Management Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.526	.276	.270	.51042

a. Predictors: (Constant), Green Supply Chain Management

Analysis of Variance

Table 4 displayed an F-ratio was 44.653with a P value of .000 indicating significance level below 0.05. This suggests that the regression model being examined exhibits a strong degree of goodness of fit. Furthermore, the findings demonstrate a positive significant association between green supply chain management and performance of Kenyan food and beverage manufacturing firms. As a result, green supply chain boosts Kenyan food and beverage firms' performance.

Table 4: ANOVA for Green Supply Chain Management (GSCM)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.634	1	11.634	44.653	.000[b]
	Residual	30.482	117	.261		
	Total	42.116	118			

a. Predictors: (Constant), Green Supply Chain Management (GSCM)

b. Dependent Variable: Performance (P)

The statistical analysis in Table 4 demonstrates a notable relationship between green supply chain management and performance. Model value of 0.00 (b1 = .393, β = .526). Moreover, the t-statistic for the regression coefficient of green supply chain management is significant at the.05 level (T = 14.124, p < .05), indicating the rejection of the null hypothesis. The findings suggest a meaningful positive association between green supply chain management and performance of food and beverage manufacturing firms in Kenya. Equation 1 depicts the regression equation for model 1, which predicts a 39.3% gain in performance for every unit increase in green supply chain management.

$$Performance = 2.863 + .393 Green\ Supply\ Chain\ Management \ldots\ldots\ldots\ldots\ldots Equation\ 1$$

Table 5: Coefficient of Regression for Green Supply Chain Management (GSCM)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constan)	2.863	.203		14.124	.000
	Green Supply Chain management	.393	.059	.526	6.682	.000

a. Dependent Variable: Performance (P)

b. Predictor Variable: Green Supply Chain (GSC)

Performance

This section presents the descriptive statistics and analysis of performance.

Descriptive Analysis of Performance

Table 6 presents findings that highlight the positive impact of green supply chain management on various performance metrics in Kenyan food and beverage manufacturing companies. According to the data, 74% of respondents agreed that their company had increased earnings and sales, with a mean score of 4.1261 and a standard deviation of 0.8592. Additionally, 83.2% of respondents indicated that their firm guarantees a reduction in all supply chain costs, reflected by a mean of 4.3193 and a standard deviation of 0.8123. Furthermore, 61.3% agreed that their company has implemented lean techniques, with a mean score of 3.6387 and a standard deviation of 1.1255.

The findings also show that 98.3% of respondents believed that employees are aware of organizational policies and are not influenced by corporate strategy, with a mean of 4.6387 and a standard deviation of 0.5164. Moreover, 72% of respondents agreed that firms should incorporate knowledge processes to improve learning throughout the company, with a mean response of 3.6896 and a standard deviation of 0.78743. Additionally, 73% of respondents agreed that the company supports ongoing training and development to enable staff to improve research, with a mean of 4.1421 and a standard deviation of 0.84567. In order to improve customer satisfaction, 84% of respondents agreed that the company monitors the quality of services provided, with a mean response of 3.9664 and a standard deviation of 0.59564. Lastly, 94.9% of respondents believed that firms should offer concurrent incentives to encourage repeat business, with a mean score of 3.2521 and a standard deviation of 0.89292.

These results support Daft's (2015) assertion that the Balanced Scorecard (BSC) is a performance evaluation tool used by businesses to set priorities for their projects, services, and goods, meet goals, and schedule routine tasks. The BSC allows businesses to track and assess the effectiveness of their strategies to ascertain overall performance. Furthermore, the BSC is a systematic report that evaluates company performance and goals based on four perspectives: internal business, financial, customer, and learning and growth. These perspectives are crucial for implementing strategy and assessing a company's performance (Balaji et al., 2021; Pierce, 2022; Camilleri, 2021).

Table 6: Descriptive statistics of performance

Performance statements	SD	D	N	A	SA	Mean	Std Dev
Our firm had improved profit on sales	0.0 %	2.5%	23.5 %	32.8 %	41.2 %	4.1261	.85919
Firm ensure all supply chain cost are reduced	0.0 %	2.5%	14.3 %	31.9 %	51.3 %	4.3193	.81233
Our firm had adopted lean practices	6.7 %	7.6%	24.4 %	37.8 %	23.5 %	3.6387	1.12545
Firm employees are familiar with organizational policies and are not influenced by corporate strategy	0.0 %	0.0%	1.7%	32.8 %	65.5 %	4.3687	0.51636
Our firm has knowledge integration mechanisms to enhance learning in the organization	7.2 %	2.1%	19.8 %	59.7 %	13.2 %	3.6896	.78743
Firm embraces continuous training and development to equip employees to enhance research	2.8 %	2.5%	23.5 %	32.8 %	41.2 %	4.1421	.84567
Firm monitors the quality of the services rendered to the customers to enhance satisfaction	0.0 %	0.0%	19.3 %	64.7 %	16.0 %	3.9664	0.59564
Our firm have simultaneous incentives for loyal customers	0.0 %	0.8%	54.6 %	40.3 %	4.2%	3.2521	.89292

CONCLUSIONS

The study concludes that there is a strong positive correlation between the performance of Kenyan food and beverage manufacturing enterprises and their green supply chain

management. It is projected that performance will increase with each unit improvement made to the green supply chain management. As green supply chain management practices grow, food and beverage manufacturers will perform better. Furthermore, the survey discovered that adopting green design, green packaging, green procurement, and green logistics practices has significantly enhanced the performance of these companies. The study also found that Kenyan producers of food and beverages have already improved their performance by implementing green supply chain management practices.

RECOMMENDATION

The study recommends that food and beverage manufacturing firms assess and improve their green supply chain policies to enhance performance. Key recommendations include providing specifications of green products to suppliers, selecting the supply base based on environmental objectives, and implementing eco-labeling during the distribution of products. Additionally, firms should purchase energy-saving production equipment. To ensure the adoption of green supply chain practices, the study suggests conducting environmental audits of the supply base.

Further recommendations include increased collaboration with suppliers to standardize biodegradable packaging materials, investing in research and development to enhance eco-design products, and sensitizing both firms and suppliers to the benefits of green products. The firm should also enhance distribution by ensuring vehicle emission control, selecting proper modes of transport, and using storage equipment with sustainable powering options.

REFERENCES

Achuora, A (2018) Effect of green supply chain management practices on the performance of manufacturing firms In Kenya. *Global scientific journal* 6 (8), 669-862.

Chebichii, B. D., Namusonge, G. S., & Makokha, E. N. (2022). Influence of Supplier sustainability on Organizational Performance in Food and Beverage Manufacturing Companies in Kenya. *International Journal of Academic Research in Business and Social Sciences,* 12(1) 2326– 2343.

Chygryn, O., Bilan, Y., & Kwilinski, A. (2020). Stakeholders of Green competitiveness: Innovative approaches for creating communicative system. *Journal of Marketing and Management of Innovations,* 3(6), 358–370.

Cosimato, S. & Troisi, O. (2015). Green supply chain management: Practices and tools for logistics competitiveness and sustainability. The DHL case study, *The TQM Journal*, 27 (2), 256-276.

Diab, S. M., Al-Bourini, F. A., & Abu-Rumman, A. H. (2015). The impact of green supply chain management practices on organizational performance: A study of Jordanian food industries. *Journal of Management and Sustainability*, 5(1), 149–157.

Digalwar, A.K., Mundra, N., Tagalpallewar, R.A., & Sunnapwar, V.K. (2017). Road map for the implementation of green manufacturing practices in Indian manufacturing industries: An ISM approach, Benchmarking: *An International Journal*, 24 (5), 1386-1399.

Eltayeb, T.K. (2019). Green manufacturing initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes, Resources, Conservation and Recycling, 55 (5), 495– 506.

Eshikumo, S. (2017). Green Manufacturing and Operational Performance of a Firm: Case of Cement Manufacturing in Kenya. *International Journal of Business and Social Science*, 8(4) 23-42.

Famiyeh, S., Adaku, E., Gyampha, K., Darko, D., & Teye, C. (2018). Environmental management practices, operational performance and environmental performance. *Journal of Manufacturing Technology Management*, 29 (3), 588-607.

Govindan, K.; Khodaverdi, R.; Vafadarnikjoo, A. (2015) Intuitionistic fuzzy based DEMATEL method for developing green practices and performances in a green supply chain. *Expert Syst*., 42, 7207–7220.

Jepchumba, N., Ngugi, P., Odhiambo, R. and Shale, N. (2022). Freight Management and Performance of Food and Beverage Manufacturing Firms in Kenya, *International Journal of Managerial Studies and Research (IJMSR)* 10 (4) 25-35.

Khan, S. A., & Qianli, D. (2017). Impact of GSCM practices on firms' performance: An empirical study from Pakistan's perspective. *Journal of Environmental Science and Pollution Research*, 24, 16829–16844.

Kiiru, L. M., & Ogutu, M. (2017). Adoption of Green Supply Chain Management Practices by Manufacturing Firms in Nairobi, Kenya. *International Journal of Academic Research in Business and Social Sciences*, 7(12), 754-769.

Kumari, J. V. J. (2018). A study on the impact of leadership on organizational performance. *International Journal of Advanced Educational Research*, 3(2), 535–538.

Mosbei Bor, J., Ngugi, P. and Odhiambo, R. (2021). *Green supply chain management practices and performance of food and beverage processing sector in Kenya*. Ph.D. Thesis Jomo Kenyatta University of Agriculture and Technology, Juja, Kenya.

Muthoni, J. P., & Mose, T. (2020). Influence of supply chain management practices on performance of food and beverage manufacturing firms in Kenya. *International Academic Journal of Procurement and Supply Chain Management*, 3(2), 45-62.

NEEMA (2018). Environmental Pollution Report. Nairobi: Government Printers.

Onditi, F., Wanjau, K., & Ogutu, M. (2020). Barriers and Enablers to Green Procurement Implementation among Manufacturing Firms in Nairobi, Kenya. *International Journal of Supply Chain Management*, 9(1), 248-259.

Pomegbe, W. W. K., Li, W., Dogbe, C. S. K., Sarsah, S. A., & Owusua, E. A. (2019). Firm performance and competitive advantage. The role of green supply chain management practices. *Journal of Business Management and Economics*, 7(8), 10–22.

Rashid, S., Sakundarini, N., & Thurasamy, R. (2016). The impact of sustainable manufacturing practices on sustainability performance: Empirical evidence from Malaysia. *International Journal of Operations and Productions Management.* 37 (2), 182- 204.

Shrivastava, S. & Shrivastava, L. (2017). A systematic literature review on green manufacturing concepts in cement industries. *International Journal of Quality & Reliability Management*, 34 (1), 68-90.

Shrivastava, S. & Shrivastava, L. (2017). A systematic literature review on green manufacturing concepts in cement industries. *International Journal of Quality & Reliability Management*, 34 (1), 68-90.

Thiga. H., Chege, D., & Arani, W. (2023). Green Procurement and Performance of Food and Beverage Manufacturing Firms in Kenya. *International Journal of Supply Chain Management*, 8(2), 16–24.

Vijayvargy. L., Thakkar J., Agarwal, G. (2017) Green supply chain management practices and performance: The role of firm-size for emerging economies. *Journal of Technology Management*. 28(3) 299–323.