



Effects of Reverse Logistics Practices on the Performance of 4 and 5 Star-Rated Hotels in Nairobi County, Kenya

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Abstract

Performance is key to hospitality firms. Reverse logistics practices can contribute to firm performance. However, empirical evidence regarding the effects of the reverse logistics on organizational performance in the hospitality industry is limited especially in developing economies such as Kenya. This study therefore examined the effect of reverse logistics practices on the performance of 4 and 5 star rated hotels in Nairobi County. The study was anchored by natural resource-based view theory and the balanced score card model. The study adopted a pragmatic research paradigm and employed a convergent mixed-methods design. The sample size was 273 respondents. Reliability and validity were confirmed, with all constructs recording Cronbach's alpha values above 0.8 and Average Variance Extracted (AVE) values above 0.5. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to analyze both formative and reflective constructs. Reverse logistics practices showed a positive and statistically significant effect on performance ($\beta = 0.22$, $p < 0.001$). The qualitative findings showed that hotels actively integrated reverse logistics and circular economy principles into their operations. The study concluded that reverse logistics practices contributed to the performance outcomes of hospitality firms. The study recommends that hospitality organizations need to put in place policies and practices that promote reverse logistics practices so as to realize positive performance outcomes. The study contributes to the NRBV theory



by demonstrating that reverse logistics practices can function as an organizational capability that enables hotels to convert environmental resources and waste streams into performance enhancing outcomes.

Keywords: Reverse logistics, Reuse, Recycle, Remanufacturing, Performance, Green Supply Chain Practices

Introduction

Performance is a critical indicator of organizational success and reflects the extent to which an organization achieves its strategic, operational, financial, and customer-related objectives (Richard et al., 2009). Contemporary studies increasingly advocate for measuring organizational performance using multidimensional frameworks such as the Balanced Scorecard (BSC), which evaluates performance through financial, customer, internal business process, and learning and growth perspectives rather than relying solely on financial indicators (Kaplan & Norton, 1996).

Green supply chain management (GrSCM) has grown tremendously in the recent past, and there is continued exploration of knowledge in this area (Islam et al., 2017). GrSCM is defined as integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers, as well as end-of-life management of the product after its useful life (Srivastava, 2007).

Reverse logistics has emerged as an important green supply chain management practice with the potential to improve organizational performance by facilitating the recovery, reuse, recycling, remanufacturing, and environmentally responsible disposal of products and materials. Recent empirical evidence indicates that organizations implementing reverse logistics practices report improved firm's environmental efficiency overall competitiveness and performance (Saruchera & Asante-Darko, 2021; Thiga et al., 2023). These outcomes closely align with the four perspectives of the balanced scorecard model.

Reverse logistics plays a crucial role in promoting sustainability within the hotel industry by managing the return and reprocessing of materials, thus reducing waste and conserving resources (Muthuswamy & Sharma, 2023). There are several ways in which reverse logistics has been conceptualized in the hospitality industry. According to Muthuswamy & Sharma, (2023), it involves recycling, reuse, remanufacturing, and repair, which are essential for environmental conservation and operational efficiency. According to Migdadi (2023), reverse logistics in the hospitality industry comprises recycling, reusing and remanufacturing and upcycling. For the purposes of this study, reverse logistics was operationalized using recycling, reuse and remanufacturing.



Despite the growing body of literature, important research gaps remain. Most reverse logistics studies have focused in other industries such as the manufacturing industries(Thiga et al., 2023;Chege, 2022) besides there is limited attention to use of comprehensive organizational performance measured such as the balanced scorecard framework and additionally, studies regarding reverse logistics and performance from the hospitality industry particularly in developing economies, like Kenya, remain scarce. Addressing these gaps would requires a more comprehensive understanding of how reverse logistics influences the performance of 4 to 5 star rated hotels in Nairobi County, Kenya.

Literature Review

One of the key components of a green supply chain is reverse logistics (Chamanthi et al., 2023). Organizations can promote a more sustainable and environmentally friendly business environment by emphasizing reverse logistics (Tahan et al., 2024). The term reverse logistics denotes the process by which materials move in the opposite direction, specifically from customers back to suppliers (Muthuswamy & Sharma, 2023). Rogers and Tibben-Lembke (1999) provided a comprehensive definition of reverse logistics; it is the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal.

Some studies have established a positive relationship between reverse logistics and performance(Saruchera & Asante-Darko, 2021;Chamanthi et al., 2023;Suleiman, 2023). Kazancoglu et al., (2021) studied the Performance evaluation of reverse logistics in food supply chains in a circular economy using system dynamics and found that by reducing food loss and waste, reverse logistics operations in a food supply chain can make a substantial contribution to green performance management. According to Ajani et al., (2026), reverse logistics accounted for 65.2% of the differences in organizational performance and had a positive, statistically significant effect. The study asserted that reverse logistics plays a crucial role in influencing organizational results. Additionally, Tahan et al. (2024) study among Lebanese non-chain restaurants revealed that there was a strong positive relationship between reverse logistics and environmental performance.

Thiga et al., (2023) in their study in Kenya found that reverse logistics positively affected firm performance. The researchers discovered that organizations with effective product return systems, recycling initiatives, and waste reduction strategies experienced better operational efficiency and higher customer satisfaction. The study concluded that reverse logistics capabilities improve competitiveness and sustainability within manufacturing industries. Khan et al., (2024) found out that these practices significantly improved competitive advantage



and organizational performance. The study revealed that activities like product recovery, recycling, and remanufacturing led to better operational efficiency, cost reduction, customer loyalty and enhanced sustainability. Moreover, Chege, (2022) revealed that reverse logistics had both financial and market implications in the manufacturing firms in Kenya. Tavares de Carvalho et al., (2024) in their case study using a convenience sample of customers in a rural tourism company in Portugal assessed how guest and owner satisfaction can be enhanced through the circular economy principles. The study established that the circular economy principles such as reuse and recycle and contributed to both customer satisfaction and operational efficiency.

Appiah and Owusu-Bio, (2024) did a survey to establish reverse logistics and financial performance among 200 manufacturing firms in Ghana. Partial least squares structural equations modeling results found a significant negative relationship between reverse logistics practices and financial outcomes. Furthermore, Nthiwa et al. (2024) using a positivist approach and an explanatory survey research design established that the implementation of reverse logistics practices had a significant negative effect on the performance of food and beverage manufacturing companies in Kenya.

Recycling refers to the conversion of organic materials into entirely new products (Ioannidis et al., 2021). Recycling practices in the context of restaurants include practices such as recycling food waste as organic compost, collecting sorting and selling waste for recycling purposes, recycling grey water by installing a waste water treatment plant, using recycling bins for different kinds of waste, recycle swimming pool water for flushing toilets, recycling air conditioning water, recycling garbage from the garden to make compost (Migdadi, 2023). The connection between recycling and performance improves when organizations include recycling in their wider circular economy plans. Magnano et al., (2024) point out that recycling works best when backed by innovation, technology, and a strong commitment from the organizations. Organizations that merge recycling with resource recovery and circular business models often achieve better environmental and operational results than those that depend only on traditional waste management methods. Chiu and Hsieh (2016) established that green practices, where recycling was one of the variables, had an indirect effect on firm performance through green capability. Additionally, Kamanga and Osoro (2022) study examined reverse logistics recycling practices and Performance in selected large manufacturing firms in Nairobi County, Kenya. The Pearson correlation coefficient for the output of the study revealed that recycling practices accounted for 31.7% of the variations in firm performance. Moreover, Jyoti et al., (2024) study findings suggested that hotels recycling programs contributed to improved environmental performance through waste reduction and lower greenhouse gas emissions.



International evidence from Gull et al., (2022) found that, although higher levels of waste recycled were generally associated with better financial performance, the overall waste management-performance relationship was influenced by operating costs, industry-specific factors, and other factors. More recent results also suggest that recycling may yield only limited short-term benefits. On the contrary, Garza-Reyes et al., (2026) found that recycling had a beneficial effect on long-term sustainability while having a limited short-term impact on operations.

Reuse is defined as the re-utilization of a product, or a component of it, following its initial life cycle in its original application (Ioannidis et al., 2021). Reuse involves the collection of entirely unused or minimally used products from consumers and re-integrating them into the supply chain without any modifications or processing (Muttimos, 2014). Reusing includes cleaning, refurbishing, repairing and recovering old goods (Chege, 2022). Re-use in the hospitality context refers to practices such as trading used oil, donating food, donating food to be reused as animal feed, reusing garbage liners if clean, appointing a registered collector to handle the obsolete electronic appliances, and using batteries that are chargeable (Migdadi, 2023). Reusing products is a cost-efficient method of reducing waste (Triguero et al., 2023). Reuse can increase overall resource efficiency and produce additional revenue from various usage cycles (Ranta et al., 2018).

In manufacturing environments, reuse practices have been empirically linked to improved cost efficiency and value recovery. Psarommatis et al., (2025) found that firms adopting reuse and repurposing strategies benefit from lower production costs and higher resource productivity due to reduced material input requirements. The study also highlights that reuse contributes to value creation by transforming waste streams into secondary resources, thereby strengthening competitive advantage. In addition, reuse contributes to organization resilience and competitive advantage by increasing efficiency in the utilization of available resources and materials (Zaki, 2025).

De et al., (2019) conducted a study among 65 Indian small and medium-sized manufacturing enterprises to ascertain the influence of reverse logistics waste-management practices, which include reuse and recycling, on financial performance. The authors' results demonstrated that the two variables are negatively related, as waste-management activities incur significantly high capital and operating costs and offer limited economic benefits for the time being. Uhrenholt et al., (2022) performed a systematic review of the literature on product take-back systems and concluded that product life-cycle recovery (PLCR) methods such as reuse, refurbishing, remanufacturing, and recycling face significant financial barriers on the supply chain due to complexity and cost.

Remanufacturing plays a crucial role in reverse logistics. It refers to the process of restoring the functionality of high-value end-of-life products, which is regarded as a significant component in reverse logistics systems aimed at value



recovery. Remanufacturing refers to where a product is retrieved from use, evaluated and subsequently either repaired, refurbished or completely overhauled (Muttimos, 2014). Remanufacturing in the context of hotels includes practices such as using glass bottles for decoration, using waste to generate energy, using torn towels as cleaning rags, and upcycling wooden pallets into new furniture (Migdadi, 2023)

There are several benefits of remanufacturing (Yu,2022). According to Yu (2022), remanufacturing enhances all three pillars of sustainable development. From the economic perspective, remanufacturing may help to achieve a 50% cost reduction (Yu, 2022). From an environmental perspective, remanufacturing has been demonstrated to be environmentally efficient throughout the entire product life cycle by significantly reducing waste generation and resource consumption (Yu, 2022). From a social standpoint, remanufacturing offers increased business opportunities and generates additional employment (Yu, 2022).

Muttimos (2014) established that the enhanced organizational performance of manufacturing companies was dependent on a greater implementation of remanufacturing reverse logistics. Similarly, Chege (2022) established that reverse logistics practices through practicing remanufacturing reverse logistics, alcohol manufacturing firms were able to save on cost of raw materials and ultimately production costs.

A systematic review by Vogt Duberg et al., (2024) revealed that only a limited number of studies provide industry-oriented assessments of the profitability of initiating remanufacturing, thus highlighting the difficulty firms have in their endeavors of determining whether remanufacturing will be economically viable.

Theoretical Review

Natural Resource-Based View Theory

The Natural Resource-Based View (NRBV) Theory, proposed by Hart (1995), extends the Resource-Based View by arguing that organizations achieve sustained competitive advantage through capabilities that enhance environmental sustainability. In reverse logistics, the NRBV suggests that firms create value by recovering, reusing, remanufacturing, and recycling products and materials, thereby reducing waste and improving resource efficiency. The execution of reverse logistics holds significant as it efficiently reduces waste production through recycling and diminishes energy usage via the practice of reuse. (Muthuswamy & Sharma, 2023). Reverse logistics offers tangible and intangible benefits by recovering value from used or returned products and extending their lifespan, rather than relying on new raw materials and wasting labor and time. (Banihashemi et al., 2019).



The Balanced Scorecard Model

The balanced scorecard model was created by Kaplan and Norton in 1992. One of the most significant frameworks for strategic performance management is still the model. By incorporating indicators from four perspectives—financial, customer, internal business processes, and learning and growth—the model was created to get around the drawbacks of conventional financial performance measures (Kaplan & Norton, 1992). They argue that from a financial standpoint, the objective is to make sure the company is meeting its financial goals and providing value to its owners. This viewpoint emphasizes return on investment (ROI), cost control, profitability, and revenue development (Kaplan & Norton, 2005). The objective of the customer viewpoint according to the model, is to guarantee the customer value proposition and concentrates on how the company differentiates itself from its rivals in order to interact, sustain, and fortify relationships with its target clientele while the learning and growth perspective focuses on the organization's ability to sustain and improve its long-term growth and performance through the development of its internal competencies. The internal process perspective on the other hand, highlights the internal operations that must be innovated or improved in order to meet the company's goals. By combining financial and non-financial performance metrics, the Balanced Scorecard (BSC) offers a thorough framework for evaluating reverse logistics' impact on organizational success. However, empirical evidence linking reverse logistics to multidimensional organizational performance, particularly using the balanced scorecard framework in the hospitality sector, remains limited, highlighting a need for further research. Drawing on the NRBV and the balanced scorecard model foregoing empirical evidence, this study tests the following null hypothesis:

H₀₁: Reverse practices do not have a significant effect on the performance of 4- and 5-star rated hotels in Nairobi County, Kenya

Research Methodology

A mixed-methods research design was used in this study and built upon the pragmatism research paradigm. Data was collected in 4–5-star hotels in Nairobi County, Kenya and the sample size was 273 Procurement, restaurant managers, and executive chefs of all ninety-one (91) 4-5-star-rated hotels in Nairobi County, Kenya and 13 purposively selected food and beverage managers were interviewed. Data collection was done using a structured questionnaire and interview schedule. Construct validity was achieved by anchoring the study to theories relevant to the study. Reliability was tested using Cronbach alpha coefficient while the average variance extracted (AVE) was used to test convergent validity while the Fornell-Larker criterion was used to measure discriminant validity. Descriptive statistics, content analysis and partial least squares structural equation modeling were used to analyze data.



Results

Response rate

The response rate was 252 out of 273, showing a response rate of 92.6% from all the expected respondents. This was higher than the threshold of 60-80% often considered reliable from sample surveys.

Reliability Analysis

The internal consistency of the research instrument items was assessed using Cronbach Alpha coefficient. The reliability value of each of the variables is presented in Table 1. Reliability was demonstrated since the overall Cronbach's alpha was greater than 0.7 therefore no variable had to be removed. The findings reverse logistics practices had coefficient of 0.890, while Performance had a coefficient of 0.868. The results indicate that the questionnaire used in this study was highly reliable for the actual survey.

Table 1: Reliability analysis

Variables	Cronbach's alpha	Items No.	Comment
Reuse Practices	0.859	7	Acceptable Reliability
Recycling Practices	0.887	7	Acceptable Reliability
Remanufacturing Practices	0.848	8	Acceptable Reliability
Reverse Logistics Practices	0.890	22	Acceptable Reliability
Financial Perspective	0.891	5	Acceptable Reliability
Customer Perspective	0.887	4	Acceptable Reliability
Internal perspective	0.870	4	Acceptable Reliability
Learning and growth	0.803	4	Acceptable Reliability
Performance	0.868	17	Acceptable Reliability

Reverse Logistics Practices and Performance Validity Test

The validity test reported that the factor loadings for Reverse Logistics Practices were higher than 0.4, an indication that the factors were valid, against communalities of 1.0. This indicated that the factors were valid as shown in Table 2 below.



Table 2: Reverse Logistics Practices and Performance Validity Test

Reverse Logistics Practices Items	Initial	Extraction
Reuse Practices		
Our establishment prioritizes reusable cutlery, crockery, and service ware over disposables	1.000	.747
Our establishment reuses delivery containers to reduce waste	1.000	.953
Our establishment reuses leftover ingredients and partially used items in production, following food safety standards	1.000	.743
Our establishment encourages staff to adopt reuse practices in daily operations	1.000	.846
Our establishment has a structured system for collecting reusable items from customers or suppliers	1.000	.923
Our establishment returns delivery containers to suppliers for repeated use	1.000	.808
Our establishment donates leftover food to relief agencies	1.000	.883
Recycling Practices		
Our establishment has separate bins for recycling plastics, glass, paper, and metals	1.000	.690
Our establishment recycles food waste through composting	1.000	.909
Our establishment works with certified recycling companies to manage waste responsibly	1.000	.747
Our establishment regularly monitors and reports recycling performance	1.000	.916
Our establishment promotes recycling awareness among customers	1.000	.785
Our establishment recycles most of our establishment's total waste	1.000	.945
Our establishment recycles grey water	1.000	.903
Remanufacturing Practices		
Our establishment uses kitchen equipment and furniture that are repaired and remanufactured instead of being discarded	1.000	.827
Our establishment sources remanufactured equipment from suppliers where possible	1.000	.932
Our establishment has a procurement policy that favors suppliers who provide remanufactured goods	1.000	.909
Our establishment employees are encouraged to report and suggest remanufacturing options for worn-out assets	1.000	.971



Our establishment partners with external service providers for remanufacturing and refurbishing services	1.000	.951
Our establishment uses technology to manage the reverse flow of materials for remanufacturing	1.000	.852
Our establishment uses waste to generate energy.	1.000	.812
Our establishment uses waste like used glass bottles for decoration.	1.000	.860
Performance Items	Initial	Extraction
Financial Perspective		
Our establishment experienced revenue growth compared to previous years	1.000	.868
Our establishment's food and beverage costs remained within the set budget	1.000	.879
The profit recorded by our establishment this year is higher than the profits reported in the previous years	1.000	.976
Our establishment's return on investment (ROI) from green initiatives is positive	1.000	.764
Our establishment's overall sales increased over the past year	1.000	.814
Customer Perspective		
Our establishment received positive feedback regarding customer satisfaction with their dining experience	1.000	.833
Our establishment experiences a significant portion of the customers returning to dine in the establishment again	1.000	.939
Our customers frequently recommend our establishment to others	1.000	.915
Our establishment effectively resolves customer complaints to their satisfaction	1.000	.844
Internal perspective		
Our establishment serves customers quickly from the moment they place an order	1.000	.930
Our food quality is consistently high across all offerings	1.000	.698
Our establishment successfully improved and streamlined its internal processes	1.000	.619
Our establishment demonstrates high efficiency with a favorable average table turnover rate per shift	1.000	.889
Learning and growth		
Our establishment is committed to investing in staff training and development	1.000	.919



Our employees generally express satisfaction with their work environment	1.000	.956
Our establishment actively identifies and develops employee skills through targeted training programs	1.000	.853
In the past year our establishment successfully introduced new menu items and services	1.000	.707

Extraction Method: Principal Component Analysis

On the other hand, the validity test reported that the factor loadings for performance were higher than 0.4, an indication that the factors were valid, against communalities of 1.0. This indicated that the factors were valid as shown in table 4.4 below.

Descriptive Statistics for Reverse Logistics Practices

Table 4 presents the descriptive statistics for Reverse Logistics Practices, categorized into three dimensions: Reuse Practices, Recycling Practices, and Remanufacturing Practices. Overall, the findings indicate a high level of adoption of reverse logistics practices across establishments, with all three dimensions recording mean scores close to or above 4.00, reflecting strong institutional commitment to waste reduction, resource recovery, and circular economy principles.

Table 4: Descriptive statistics for Reverse Logistics Practices

Reverse Logistics Practices	SD	D	N	A	SA	Mean	SD
Reuse Practices						4.01	.403
Our establishment prioritizes reusable cutlery, crockery, and service ware over disposables	3 (1.2)	8 (3.2)	5 (2.0)	202 (80.2)	34 (13.5)	4.02	.625
Our establishment reuses delivery containers to reduce waste	1 (0.4)	5 (2.0)	5 (2.0)	204 (81.9)	34 (13.7)	4.06	.520
Our establishment reuses leftover ingredients and partially used items in production, following food safety standards	0 (0.0)	3 (1.2)	4 (1.6)	202 (81.1)	40 (16.1)	4.12	.460
Our establishment encourages staff to adopt reuse practices in daily operations	0 (0.0)	10 (4.0)	7 (2.8)	200 (81.0)	30 (12.1)	4.01	.559
Our establishment has a structured system for collecting reusable items from customers or suppliers	6 (2.4)	5 (2.0)	3 (1.2)	200 (80.3)	35 (14.1)	4.02	.672



Our establishment returns delivery containers to suppliers for repeated use	12 (4.8)	13 (5.2)	6 (2.4)	194 (77.9)	24 (9.6)	3.82	.857
Our establishment donates leftover food to relief agencies	0 (0.0)	8 (3.2)	5 (2.0)	197 (79.1)	39 (15.7)	4.07	.549
Recycling Practices						3.96	.515
Our establishment has separate bins for recycling plastics, glass, paper, and metals	8 (3.2)	11 (4.4)	5 (2.0)	196 (77.8)	32 (12.7)	3.92	.777
Our establishment recycles food waste through composting	1 (0.4)	7 (2.8)	6 (2.4)	197 (79.1)	38 (15.3)	4.06	.568
Our establishment works with certified recycling companies to manage waste responsibly	3 (1.2)	5 (2.0)	7 (2.8)	197 (79.1)	37 (14.9)	4.04	.604
Our establishment regularly monitors and reports recycling performance	3 (1.2)	10 (4.0)	11(4 .4)	198 (79.8)	26 (10.5)	3.94	.646
Our establishment promotes recycling awareness among customers	9 (3.6)	11 (4.4)	5 (2.0)	200 (80.3)	24 (9.6)	3.88	.779
Our establishment recycles most of our establishment's total waste	11 (4.4)	10 (4.0)	7 (2.8)	194 (77.9)	27 (10.8)	3.87	.825
Our establishment recycles grey water	1 (0.4)	5 (2.0)	5 (2.0)	199 (79.9)	39 (15.7)	4.08	.536
Remanufacturing Practices						3.99	.592
Our establishment uses kitchen equipment and furniture that are repaired and remanufactured instead of being discarded	4 (1.6)	17 (6.8)	4 (1.6)	177 (70.5)	49 (19.5)	4.00	.792
Our establishment sources remanufactured equipment from suppliers where possible	3 (1.2)	14 (5.6)	8 (3.2)	189 (75.9)	35 (14.1)	3.96	.712
Our establishment has a procurement policy that favors suppliers who provide remanufactured goods	4 (1.6)	13 (5.2)	5 (2.0)	187 (75.1)	40 (16.1)	3.99	.732
Our establishment employees are encouraged to report and suggest remanufacturing options for worn-out assets	2 (0.8)	18 (7.2)	5 (2.0)	182 (73.1)	42 (16.9)	3.98	.743



Our establishment partners with external service providers for remanufacturing and refurbishing services	5 (2.0)	18 (7.1)	12 (4.8)	175 (70.3)	39 (15.7)	3.90	.817
Our establishment uses technology to manage the reverse flow of materials for remanufacturing	6 (2.4)	8 (3.2)	7 (2.8)	174 (69.9)	54 (21.7)	3.84	.964
Our establishment uses waste to generate energy.	4 (1.6)	9 (3.6)	8 (3.2)	164 (66.4)	62 (25.1)	4.05	.768
Our establishment uses waste like used glass bottles for decoration.	4 (1.6)	9 (3.6)	8 (3.2)	164 (66.4)	62 (25.1)	4.10	.753

Source: Author (2026)

Reverse logistics practices were generally well embedded across the establishments, reflecting strong alignment with circular economy principles. Reuse practices recorded high adoption, particularly the safe reuse of leftover ingredients ($M = 4.12$, $SD = 0.460$), staff encouragement to adopt reuse practices ($M = 4.01$, $SD = 0.559$), and donation of surplus food ($M = 4.07$, $SD = 0.549$), although returning delivery containers to suppliers was less common ($M = 3.82$, $SD = 0.857$). Recycling practices also showed high adoption ($M = 3.96$, $SD = 0.515$), supported by composting, grey-water recycling, waste segregation, and collaboration with certified recyclers, although customer engagement and waste monitoring were comparatively weaker. Remanufacturing practices on the other hand, recorded a high overall mean of 3.99 ($SD = 0.592$), with establishments repairing equipment, sourcing remanufactured goods, and repurposing waste materials. Overall, the findings indicate that reuse, recycling, and remanufacturing contribute substantially to waste reduction, resource efficiency, cost savings, and environmental sustainability in food service operations.

The study also sought to establish the views of food and beverage managers on reverse logistics practices adopted by their establishments. The responses from the interview are as summarized below;

Researcher: *Could you share with me reverse logistics practices that your hotel has adopted?*

Interviewee 1,3,7,9,11,13: *we encourage our employees to engage in reverse logistics practices for example use of left over ingredients.*

Interviewee 13,9; *we have an inhouse water treatment facility*

Interviewee 1,2,3,4,7,9,10,11,12: *Our hotel uses glass bottles instead of plastic ones.*

Interviewee 1,3,9- *we collaborate with third party partners like Taka taka solutions for recycling and reuse of waste.*



Interviewee 1,3,9,11,13- *we collaborate with suppliers regarding product returns, for example bottles of drinks such as soft drinks.*

The qualitative findings show that hotels actively integrated reverse logistics and circular economy principles into their operations through strategies which included employee involvement where staff were engaged to drive daily recycling and creatively reuse kitchen ingredients. Embedding sustainability into routine operations was also revealed such as use of recyclable glass where organizations have transitioned to durable glass bottles which reduces single-use plastic, landfill waste, and environmental pollution. Using onsite water purification was also reported, where drinking water was treated internally thus lowering procurement and transportation costs, cuts plastic waste, and gives hotels tighter control over water quality. Use of Third-Party Partnerships was also evident such as collaborating with specialized firms like Takataka Solutions which contributed to streamlining waste sorting, processing, and regulatory compliance. Supplier collaboration was also revealed where the hotels worked with vendors to facilitate product returns such as returning excess or defective goods for take-back programs thus fostering shared environmental responsibility and supply chain efficiency.

Descriptive Statistics for Performance

The descriptive statistics for organizational performance was measured from four balanced scorecard perspectives—financial, customer, internal process, and learning and growth—as shown in Table 5. The findings show good overall performance, with all dimensions recording high mean scores above 4.00. With an overall mean score of 4.06 (SD = 0.646), the Financial Perspective indicated better financial performance during the reviewed period. The majority of respondents reported that their businesses' revenue increased in comparison to prior years (M = 4.04, SD = 0.927), suggesting better financial trends.

Table 5: Descriptive statistics for Performance

Performance	SD	D	N	A	SA	Mean	SD
Financial Perspective						4.06	.646
Our establishment experienced revenue growth compared to previous years	1 (0.4)	17 (6.7)	46 (18.3)	95 (37.7)	93 (36.9)	4.04	.927
Our establishment's food and beverage costs remained within the set budget	4 (1.6)	16 (6.4)	33 (13.2)	87 (34.8)	110 (44.0)	4.13	.979



The profit recorded by our establishment this year is higher than the profits reported in the previous years	1 (0.4)	11 (4.4)	58 (23.2)	91 (36.4)	89 (35.6)	4.02	.89 6
Our establishment's return on investment (ROI) from green initiatives is positive	0 (0.0)	11 (4.4)	57 (22.8)	108 (43.2)	74 (29.6)	3.98	.83 8
Our establishment's overall sales increased over the past year	1 (0.4)	8 (3.2)	43 (17.1)	94 (37.8)	103 (41.4)	4.16	.85 3
Customer Perspective						4.12	.66 2
Our establishment received positive feedback regarding customer satisfaction with their dining experience	0 (0.0)	2 (0.8)	49 (19.5)	110 (43.8)	90 (35.9)	4.15	.75 2
Our establishment experiences a significant portion of the customers returning to dine in the establishment again	1 (0.4)	16 (6.4)	50 (19.9)	101 (40.2)	83 (33.1)	3.99	.90 8
Our customers frequently recommend our establishment to others	0 (0.0)	6 (2.4)	41 (16.4)	111 (44.4)	92 (36.8)	4.16	.77 9
Our establishment effectively resolves customer complaints to their satisfaction	1 (0.4)	2 (3.2)	44 (17.66)	107 (42.8)	90 (36.0)	4.18	.86 0
Internal perspective						4.46	.51 7
Our establishment serves customers quickly from the moment they place an order	0 (0.0)	1 (0.4)	9 (3.6)	87 (34.7)	154 (61.4)	4.57	.58 5
Our food quality is consistently high across all offerings	0 (0.0)	0 (0.0)	10 (4.0)	133 (53.2)	107 (42.8)	4.49	.57 6
Our establishment successfully improved and streamlined its internal processes	1 (0.4)	1 (0.4)	11 (4.4)	125 (50.4)	110 (44.4)	4.44	.64 0
Our establishment demonstrates high efficiency with a favorable average table turnover rate per shift	0 (0.0)	1 (0.4)	30 (12.0)	109 (43.8)	109 (43.8)	4.31	.69 3
Learning and growth						4.23	.68 9
Our establishment is committed to investing in staff training and development	1 (0.4)	5 (2.0)	27 (10.8)	104 (41.6)	113 (45.2)	4.29	.77 0

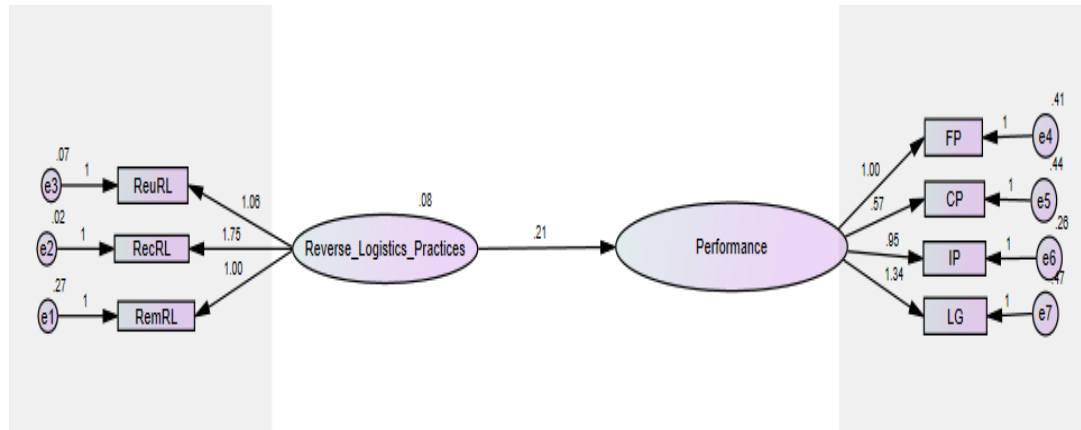


Our employees generally express satisfaction with their work environment	0 (0.0)	2 (0.8)	36 (14.5)	102 (41.0)	109 (43.8)	4.28 5	.73
Our establishment actively identifies and develops employee skills through targeted training programs	0 (0.0)	7 (2.8)	43 (17.2)	91 (36.4)	109 (43.6)	4.21 4	.82
In the past year our establishment successfully introduced new menu items and services	1 (0.4)	11 (4.4)	35 (14.0)	90 (36.0)	113 (45.2)	4.21 3	.87

Source: Author (2026)

The findings indicate that the hotels performed well across all Balanced Scorecard dimensions. The Customer Perspective recorded a high overall mean of 4.12 (SD = 0.662), reflecting strong customer satisfaction, loyalty, recommendations, and effective complaint resolution. The Internal Process Perspective had the highest overall mean of 4.46 (SD = 0.517), demonstrating operational excellence through fast service, consistent food quality, streamlined processes, and efficient table turnover. The Learning and Growth Perspective also showed favorable outcomes, with an overall mean of 4.23 (SD = 0.689), reflecting high employee satisfaction, staff training and development, innovation, and skills development. Overall, the results suggest that strong internal processes, customer satisfaction, and investment in employee development collectively support positive organizational performance.

Measurement Model



Key: *ReuRL: Reuse Practices, RecRL: Recycling Practices and RemRL: Remanufacturing Practices.*

Figure 1: Measurement Model

The standardized factor loadings are approximately 1.06, 1.75, and 1.00 respectively as shown in figure 1 showing that that Reuse Practices (ReuRL), Recycling Practices (RecRL) and Remanufacturing Practices (RemRL) are stronger



measures of the construct. The structural path revealed a positive significant effect of Reverse Logistics Practices on Performance ($\beta=0.22$, $p<.001$) suggesting a strong positive influence, whereby improved Reverse Logistics Practices results in enhanced organizational performance.

Discussions of Findings

Reverse Logistics and Performance

The objective of the study was to establish the influence of reverse Logistics on the performance of 4-5 star-rated hotels in Nairobi County, Kenya. In the SEM results, Reverse logistics had a positive significant effect on Performance. Thus, there was sufficient evidence to reject the null hypothesis H_01 .

These findings were similar to Saruchera and Asante-Darko (2021) who established that reverse logistics positively influenced the operational performance of the firm, while organizational culture strengthened the relationship. Moreover, (Khan et al., 2024) also concurs with the findings of the current study, showing that reverse logistics practices significantly improve organizational performance and competitive advantage. Moreover, these findings are similar to Muthuswamy and Sharma, (2023) who argued that reverse logistics played a crucial role in promoting sustainability within the hotel industry by managing the return and reprocessing of materials, thus reducing waste and conserving resources.

The findings were also similar to those of Kamanga and Osoro, (2022) who investigated reverse logistics and recycling practices among manufacturing firms in Nairobi County, Kenya and revealed that recycling practices significantly influenced firm performance, accounting for 31.7% of its variation. The current findings also concur with the findings of Mbeche and Juma, (2025) who provided empirical evidence that logistics and recycling practices positively contribute to the supply chain performance of hotels by enhancing operational efficiency, reducing waste, and improving resource utilization among major hotels in the Maasai Mara.

These findings contradict to those of Nthiwa et al., (2024) whose study established that the implementation of reverse logistics practices had a statistically significant negative effect on firm performance food and beverage manufacturing firms in Kenya. This outcome was largely attributed to high operational costs, logistical complexities, and inadequate infrastructure supporting reverse flows such as returns, recycling, and waste handling. The authors further noted that while reverse logistics may support environmental sustainability objectives, it can strain financial and operational resources in the short term, thereby reducing overall performance efficiency in the sector.

Furthermore, the results are not consistent with the results of Appiah and Owusu-Bio, (2024) research in Ghana who established that there exists a significant negative correlation between reverse logistics and financial performance. It was argued that such a finding is based on the fact that there were substantial costs



associated with product returns, recycling, remanufacturing, and disposal of waste that might negate any financial benefits gained through reverse logistics. These results have shown that while reverse logistics might help promote environmental sustainability and efficiency in the operations of firms, it may be financially demanding to the organization.

Al-Husain et al., (2024) also demonstrated that sustainable food supply chain practices in hotels including recovery, process discipline, and waste reduction. These provisions enhanced sustainable performance by improving operational systems and resource efficiency. Moreover, Migdadi, (2023) identified waste recovery and environmentally responsible supply chain practices as important contributors to hotel sustainability and long-term competitiveness, especially in high-category hotels where green expectations are stronger. Additionally, Alreahi et al., (2023) in their systematic review of green supply chain management in hotels, concluded that reverse logistics and related green operations are increasingly associated with improved hotel performance, particularly where sustainability is embedded in procurement, operations, and service delivery.

The findings suggested that reverse logistics practices improved hotel performance when they are systematically implemented and linked to broader green operational strategies. In 4–5 star-rated hotels, such practices likely enhance performance by reducing waste management costs, improving environmental image, strengthening process efficiency, and supporting customer expectations for responsible hospitality. Therefore, reverse logistics should be viewed not merely as waste handling, but as a strategic sustainability capability that contributes directly to competitive and operational performance.

Conclusions and Recommendations

The objective of the study was to establish the influence of reverse logistics on the performance of 4-5 star-rated hotels in Nairobi County, Kenya. The study concluded that reverse logistics practices shaped the performance outcomes of hotel firms significantly. The study recommends that hospitality organizations put in place policies and practices that promote reverse logistics practices so as to realize positive performance outcomes. The study contributes to the NRBV theory by demonstrating that reverse logistics practices can function as an organizational capability that enables hotels to convert environmental resources and waste streams into performance enhancing outcomes. The results should not be generalized without critical scrutiny beyond Nairobi's 4- and 5-star hotel segment, particularly because reverse logistics practices may vary according to hotel classification, operational scale, waste-management infrastructure, and access to reverse-logistics service providers. Hotels in Nairobi operate within a distinctive urban hospitality market characterized by relatively developed waste-recovery services, which may differ from those available to lower-rated hotels and



establishments in other Kenyan tourism destinations. Consequently, the nature, extent, and performance implications of reverse logistics practices such as reuse, recycling, and remanufacturing may differ across hotel categories and geographical contexts.

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