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**Green Supply Chain Employee Involvement on Performance of Manufacturing Firms
in Nairobi County**


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PROCUREMENT

Green Supply Chain Employee Involvement on Performance of Manufacturing Firms in Nairobi County

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Abstract

Purpose: The general objective of the study was to determine influence of green supply chain employee involvements on performance of manufacturing firms, in Nairobi County Kenya.

Methodology: The study was informed by Social Exchange Theory, Transaction Cost Theory, Resource-Based view and Resource Dependency Theory. The research design for this study was an explanatory survey research design; this is primarily a positivism approach. The population for the study will constitute manufacturing firms in Kenya. Thus, the unit of observation was 516 procurement managements from 516 manufacturing firms. The research employed stratified and simple random to select a sample of 225. This study used structured questionnaires to collect data relevant to the study. Descriptive analysis such as means, standard deviation and variance.

Findings: Linear regression models showed that green supply chain employee involvements have a positive and statistically significant influence on firm performance, highlighting their essential role in enhancing performance for manufacturing firms. A strong partnership with suppliers and specialized expertise in green supply chain management are crucial for this improvement.

Unique Contribution to Theory, Practice and Policy: The study recommends that organizations commit to ongoing education and engagement of their workforce. This includes regular training programs that inform employees about sustainable practices and their importance to the company's mission. Additionally, implementing recognition and reward systems for employees who innovate in sustainability can enhance engagement. Policymaking should also include mandatory training on environmental responsibility and a structured program for employees to propose green initiatives.

Keywords: *Green Supply Chain, Employee Involvements, Performance, Manufacturing Firms*

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INTRODUCTION

Supply chain management has been a tool within CSR that supply chains use to reduce the environmental impact of their activities (Sood, 2015). Employee involvement is one of the critical success factors that enables companies to succeed in their GSCM endeavours (Changchutoe, 2012; Toke et al., 2012). Generally, in most businesses, employees are aware of corporate social responsibilities and perceive that their company activities involve “greener” initiatives that impact society in a positive way (Changchutoe, 2012).

Furthermore, implementing environmental training gives companies the possibility to recruit talented applicants with a preference for working in companies with proactive environmental management. This could create more competitive advantage in order to attract new employees with new knowledge (Sarkis et al., 2010). Moreover, the basic principle of training is that it needs to be meaningful for workers to be successful and that it is a planned, continuous process that consist of several stages and steps, being design, implementation, evaluation and follow-up training (Diab et al., 2015). Employee involvement in sustainability programs can be traced back to green human resource management (GHRM). For organisations, it helps to improve environmental performance by setting environmental values and principles, leading to an increase of green initiatives within an organisation (Zaid et al., 2018).

The responsibilities of top management are to motivate employees to work towards achieving company’s GSCM goals, and to inspire change by enforcing a green culture (Niemann et al., 2016; Ojo et al., 2014). In addition, proper training and education are also very important aspects when implementing GSCM, as these aid in up-skilling employees to be able to run with the programmes of the organization, thus ensuring success of the initiatives. Lack of necessary skilled human resources will result in wasted efforts in implementing greening programmes within an organization (Ravi & Shankar, 2005).). Thus, there is need to study green supply chain employee involvement and its association with firm performance

In Kenya, economic policy is more export-driven. The government encourages its enterprises to meet the requirements of the Free Trade Deal with rest of the world in order to maintain the policy. The stern compliance of global environmental norms and standards is one of these benchmarks. The National Environment Management Authority (NEMA) and the Ministry of Environment and Forestry established the Climate Change Act, 2016 to address environmental and natural governance issues in keeping with these principles. As a result of external pressures like as environmental issues, legislation, or environmental growth plans, many manufacturing firms’ companies attempt to apply green supply chain employee involvement for effecting implementation of green supply chain management, or integrated environmental management. As a result, manufacturing firms in Kenya are increasingly required to construct more efficient green supply chains in order to solve market environmental hurdles and manage their overall performance. Therefore, this study attempted to contribute to new knowledge in theoretical, practical and managerial implication by assessing effect of green supply chain employee involvement on performance of manufacturing firms in Nairobi county in Kenya.

Theoretical Review

Hart (1995) claims that RBV overlooked challenges and difficulties brought by natural environment, which ought to be important when considering development of new resources and competences. This will assist in dealing with the increase of scale and scope of human activity. He reasoned that the previous organizations and economic practices might be stopped

because they continued to give out the same results. Therefore, he offered views that were natural - resource based to the firm (NRBV), which will give the firm a competitive advantage deep-rooted in “capabilities that facilitate environmentally sustainable economic activity (Hart & Dowell, 2011) of resent NRBV has been given massive support in their environment sustainability practices research that is related to logistics activities which will make the economic, market performance and operational better (Vachon & Klassen, 2006, 2008).

The authors noted how supply chain process is directly affecting the natural environment and practices that bring about and diminishes the impact. It also has the ability to develop capabilities that will improve performance that focuses on pollution prevention, product stewardship and developed markets (Hart & Dowell, 2011). Prevention of pollution main focus is pollution reduction or inefficiently use of human resource and materials in the process of manufacturing. Pollution prevention means waste reduction in lean production and total quality management which results to having a better operational performance by utilizing inputs, lower costs and cycle times.

Product stewardship involves incorporating the perspectives of the stakeholder into the product. All the activities in the value chain are included in every step so that it focuses on the product whole lifecycle from design to disposal. Firms was able to develop competitive differentiation and stronger reputation; the two are market-based performance. Hart (1995) continues to debate that the two strategies have proved to improve market and operational performance and the end result boosts profitability and cash flow to the firm, it’s also known as accounting-based performance (Irani et al., 2017).

Touboullic and walker (2015) advocated NRBV because it is reusable and this gives the firm competitive advantage. Sustainable development is essential for it helps make increased market power and differentiation of opportunities available. Inter-organizational resources are important as intra-organizational resources to stimulate supplier engagement with green supply chain employee involvements practice. In NRBV, green supply chain employee involvements as a whole necessitates that a significant number of supply chain members (resources) coordinate and incorporate environmental management into their transit mode, labeling, and reverse logistics distribution functions. This study claims that the balancing act among supply chain partners to ensure optimal distribution while minimizing environmental impact is a socially complicated resource. Thus, the theory is used to explain effect of green supply chain employee involvement and performance of manufacturing firms

Empirical Review

Ojo et al. (2014) and Pooe & Mhelembe (2014) have also found that in some organizations top management shows no commitment or offer any support to employees to ensure the realisation of successful GSCM programmes. In the context of Asian rising economies, Khan (2019) looked at the interaction between green supply chain employee involvements indices, economic, environmental, and social issues. To evaluate research hypotheses, this study used the Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square (DOLS) methodologies, which addressed the issues of endogeneity and serial correlation. The findings suggest that logistics operations, specifically logistics performance index 2 (customs clearance efficiency), logistics performance index4 (logistics service quality), and logistics performance index5 (trade and transportation-related infrastructure), are positively and significantly correlated with per capita income, manufacturing value added, and trade openness. Greater logistical activities, on the other hand, are linked to social and environmental

issues such as climate change, global warming, carbon emissions, and air pollution. Furthermore, smog, acid rain, and water pollution have a negative impact on human health. Nevertheless, this study did not link green supply chain employee involvements with firm performance. In addition, Khan study used secondary data and used panel data analysis.

In Pakistan, Khan and Dong (2017b) investigated the effects of green supply chain employee involvements and supply chain strategies on the environmental and economic performance of businesses. Data was acquired from industrial companies for their study, and the linear regression method was used. The findings show that green supply chain employee involvements boost economic performance by increasing customer happiness and trust, increasing operational efficiency, and improving environmental sustainability by reducing carbon emissions and solid waste. However, their study did not conclusive show the effect of green supply chain employee involvements in relation to other green supply chain innovation on performance of manufacturing firms,

Mutie, Odock, and Litondo (2020) found that economic performance plays a mediating role in the relationship between green supply chain employee involvements practices and the performance of logistics enterprises in Kenya. The study followed the positivist research philosophy and used a cross-sectional survey research design. A sample of 300 logistics enterprises was selected from a population of 892 logistics firms in Kenya. A systematic questionnaire was used to obtain primary data. The construct reliability (CR), average variance extracted (AVE), and Cronbach's alpha methodologies were utilized to assess validity and reliability. Covariance-based structural equation modeling was used to analyze the data (CB-SEM). According to the findings, there is a substantial beneficial association between the adoption of green supply chain employee involvements methods and the performance of Kenyan logistics enterprises. At the 0.05 significance level, the mediating influence of economic performance on the connection between green supply chain employee involvements practices and business performance was shown to be positive and significant. However, the study was conducted in logistics enterprises while current study was conducted in manufacturing firms. In addition, Muties' and other studies tested mediation aspect using SEM while current study will use hierarchical regression model.

Syanda and Getuno (2019) investigated the impact of green supply chain employee involvements strategy on the performance of Kenyan tea processing companies. A descriptive research approach was used in this analysis investigation. The target audience consisted of chiefs of procurement and finance from Kenya's sixty-six tea processing companies. In order to collect information, the study used a combination of surveys and key informant interviews. Quantitative data was coded using the Applied Mathematics Package for Social Science (SPSS) version twenty after knowledge collection. The study findings showed that green product style, green distribution and transportation, inexperienced storage, and green storage all have a favorable association with tea process corporate performance. Nevertheless, the study was carried in tea firms while current study was conducted in manufacturing firms and did not include any moderation or mediation variables.

METHODOLOGY

The research design for this study was explanatory survey research design; this is primarily a positivism approach, which falls under positivist research ontology and epistemology, an epistemological philosophy in quantitative research where we use natural scientific techniques to determine social research (Hammersley, 2013). The study relied on existing hypothesis and

theories to explain the dynamics that led to the occurrence of a specific phenomenon (Cooper and Schindler, 2011).

Target Population and Sampling

The population for the study constituted 516 manufacturing firms in Nairobi County, Kenya (KAM, 2023). Thus, the unit of observation was procurement managers in manufacturing firms. For this study, Slovin's formula (2018) also developed by Yamane (1967), was used to calculate the sample size of 225. In the first phase, stratified sampling was used to stratify the 225 sample into 13 categories of manufacturing firms in Nairobi County. Proportionate method was used in order to get equal representation, where the study was computed each stratum's sample by dividing the stratum's population with the total population and multiplying the result with the sample so as to get a proportionate representative sample from each. The final stage of probability sampling technique process was involve employing simple random sampling to select the final sample of survey respondents from each stratum. In this study, a total study sample of 225 randomly selected using SPSS.

Data Collection Instruments

This study used structured questionnaires to collect data relevant to the study. In order to obtain primary data, questionnaires were used to collect data. Questionnaires was administered to the employees of the manufacturing firm. The questionnaire was contained both open-ended and closed questions, as well as a 5-point Likert scale questionnaire was used for data collection. After review of the literature, it became evident that many studies, such as those by Pagell and Wu (2009), and Thiell (2010), used many different variables. Based on these previous studies, the study used items in conceptual framework to measure green supply chain employee involvements activities considering as dependent variables the performance is measured using both financial and non-financial indicators. Responses was recorded on 5-likert scale, 1=strongly disagree and 5=strongly agree.

Piloting

To ensure reliability of the questionnaires, a pilot study was carried out in 22 state corporations in neighbouring Thika county. The questionnaire was shared with two supervisors for content validity review in this project. Three levels of content validity were developed. Exploratory factor analysis using Kaiser-Meyer-Olkin estimate of sampling adequacy, Bartlett's test of sphericity, and varimax rotations components was used to determine factor validity. To assess and improve reliability, a pilot test was carried out where 22 questionnaires were randomly administered to head of procurement officer prior to the actual study where each group was administered 5 questionnaires. The researcher was ensure that the participants in the pilot study was have similar characteristics with target population and they was not take part in the main study. However, participants in a pilot study need not to be statistically selected. Thereafter, data was coded, and responses analysed through SPSS to determine the validity and reliability.

Data Analysis and Model Specification

The descriptive statistical techniques of mean, frequency and standard deviation was used to assess the quantitative data acquired. In this research, linear regression was used to determine the effect of green supply chain employee involvements on performance of manufacturing firms. The model used is as presented in equation 1.

$$Y = \beta_0 + \beta_1 x_1 + \varepsilon$$

X_1 : Green supply chain employee involvement,

Y: The dependent variable (performance of manufacturing firms),

β_1 : effect of slope coefficients denoting the influence of the associated independent variables over the dependent variable.

' ϵ ': Represent the error terms.

FINDINGS AND DISCUSSION

This section presents the data analysis and findings based on the study objectives. Out of 225 distributed questionnaires, 208 were returned, resulting in an initial response rate of 92.4%. After screening, six questionnaires were unusable due to missing values, leaving 202 valid responses and a final response rate of 89.77%. This high rate was achieved through the researchers' consistent engagement with respondents at research sites, including follow-up calls and flexible completion options. The final response rate of 89.77% demonstrates the effectiveness of the data collection methods, providing a solid foundation for accurate analysis and reinforcing the reliability of the study's result.

Descriptive Results

The findings in Table 1 revealed that the majority of respondents indicate positive levels of employee involvement in green supply chain activities. For instance, employees are trained on green supply chain practices (mean = 3.32, SD = 0.89) and are encouraged to contribute ideas and suggestions for improving environmental sustainability (mean = 3.31, SD = 0.87). Additionally, employees are allowed to participate in top decision-making processes related to green supply chain management (mean = 3.25, SD = 0.94), highlighting a culture of inclusivity and empowerment within the organization. Moreover, the study indicates that organizations provide resources and tools to empower employees to actively participate in eco-friendly practices and decision-making processes (mean = 4.23, SD = 0.89), demonstrating a commitment to fostering employee engagement and environmental responsibility. These findings are consistent with previous research highlighting the importance of green supply chain employee involvement in driving organizational success in green supply chain management.

Table 1: Descriptive Statistics for Green Supply Chain Employee Involvement

	Mean	Std. Dev
The company's employees are trained on green supply chain	3.32	0.89
The company allows employee to participate in top decision making of green supply chain	3.25	0.94
Our organization encourages and supports employees in the supply chain to contribute ideas and suggestions for improving environmental sustainability.	3.31	0.87
Employee are involved in all stages of implementing green supply chain strategies	2.90	0.78
The firm management allows employee to contribute their ideas in implementation of green supply chain	3.49	0.62
Our organization provides resources and tools to empower employees to actively participate in eco-friendly practices and decision-making processes.	4.23	0.89
SC employee involvement	3.42	0.63

The findings indicate that the firm has performed well across different dimensions, with moderate to high mean scores observed for each aspect. Specifically, the firm has consistently preserved a high market share in the past two years (mean = 3.21, SD = 1.035) and has experienced significant sales growth during the same period (mean = 2.49, SD = 0.865). Moreover, the firm has successfully retained most of its customers in the past two years (mean = 3.15, SD = 1.512) and has increased its market size in new markets compared to its competitors (mean = 3.85, SD = 1.142). Additionally, the firm has created a positive reputation in the industry (mean = 3.28, SD = 1.673) and improved the perception of customer satisfaction (mean = 3.57, SD = 1.064). Overall, the firm performance score is 3.26 with a standard deviation of 1.02, indicating a moderate to high level of performance across the surveyed aspects.

Table 2: Descriptive Statistics for Firm Performance

	Mean	Std. Dev
The firm has consistently preserved a high market share in the past two years.	3.21	1.035
The firm has experienced significant sales growth in the past two years.	2.49	0.865
The firm has successfully retained most of our customers in the past two years.	3.15	1.512
The firm has increased our market size in new markets compared to our competitors.	3.85	1.142
The firm has successfully created a positive reputation in the industry.	3.28	1.673
The firm has improved the perception of customer satisfaction.	3.57	1.064
Firm Performance	3.26	1.02

Correlation Analysis

Correlation analysis, as depicted in Table 3, unveils the outcomes aimed at investigating the relationships between firm performance and green supply chain employee involvement. Findings from Table 3 showed that the correlation between firm performance and green supply chain employee involvement is notably strong ($r = 0.637$, $p < 0.01$), indicating a positive and significant relationship between these variables.

Table 3: Correlation analysis

		Firm Performance	Green Supply Chain employee involvement
firm performance	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	202	
Green Supply Chain employee involvement	Pearson Correlation	.637**	1
	Sig. (2-tailed)	0.000	
	N	202	202

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

* Correlation is significant at the 0.05 level (2-tailed).

Regression Analyses

Linear regression was used to determine the combined effect of green supply chain employee involvement on firm performance. The presented model summary, ANOVA, and coefficient of estimates are in tables 3. The results indicate that the model has a moderate to strong overall fit, with an R-squared value of 0.406. This suggests that approximately 40.6% of the variance in firm performance can be explained by green supply chain employee involvement plays a significant role in explaining variations in firm performance within the studied context. Further the results of ANOVA revealed a highly significant F-statistic of 136.92 ($p < 0.05$), indicating that the regression model as a whole is a strong predictor of firm performance. The significant F-value suggests that the variation in firm performance explained by green supply chain employee involvement, is much greater than what would be expected by chance alone.

The results of the study indicate that the hypothesis concerning green supply chain employee involvement can be rejected, as the positive beta coefficient ($\beta = 0.637$, $p = 0.000 < 0.05$) demonstrates a statistically significant influence on firm performance, suggesting that higher levels of employee involvement within the supply chain positively correlate with improved performance of manufacturing firms in Nairobi County. These findings resonate with existing literature, such as the work by Ojo et al. (2014) and Pooe & Mhelembe (2014), which highlighted that a lack of commitment and support from top management can hinder the success of green supply chain management (GSCM) programs, indicating that while employee involvement is crucial, its effectiveness often relies on management support. In contrast, Khan and Dong (2017b) established that enhancing employee involvement in green supply chain initiatives not only elevates operational efficiency but also boosts economic performance by increasing customer happiness and trust, alongside improving environmental sustainability metrics through reductions in carbon emissions and solid waste. This reinforces the notion that engaged employees can contribute significantly to overall firm performance. Furthermore, the research by Mutie, Odock, and Litondo (2020) supports these findings by demonstrating a substantial beneficial association between the adoption of green supply chain employee involvement methods and the performance of Kenyan logistics enterprises, which underscores the importance of fostering employee engagement within the context of green practices for achieving business success. Additionally, the findings of Syanda and Getuno (2019) illustrate that various green practices, including green product design, green distribution, and environmentally friendly storage methods, have a favorable impact on corporate performance in the tea processing sector, suggesting that the positive influence of employee involvement observed in the current study may extend to other sectors that integrate sustainable practices within their supply chains

Table 3: Regression Analysis

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.787	0.184		4.279	0.000
Green Supply Chain employee involvement	0.734	0.063	0.637	11.701	0.000
Model Summary Statistics					
R	.637a				
R Square	0.406				
Adjusted R Square	0.403				
ANOVA statistic for model fitness					
F	136.92				
Sig.	.000b				

a Dependent Variable: firm performance

CONCLUSION AND RECOMMENDATIONS

The commitment to employee involvement in green practices also reflects a positive impact on manufacturing firm performance. The strong embrace of eco-friendly packaging initiatives signals that organizations prioritizing sustainability not only meet regulatory requirements but also align their operational goals with environmental stewardship. These initiatives result in improved product offerings and customer satisfaction, which ultimately translate to better financial performance. To maximize the impact of employee involvement in sustainability initiatives, organizations should commit to continuous education and engagement of their workforce. Recommended practices include regular training programs that inform employees about sustainable practices and their importance to the company's overall mission. Additionally, implementing recognition and reward systems for employees who innovate in sustainability can drive engagement. Policymaking should include mandatory training sessions on environmental responsibility and a structured program for employees to propose green initiatives. By empowering employees and fostering a culture of sustainability, companies can harness internal resources to improve their overall environmental performance.

However, the study has its limitation. First, the research was limited to manufacturing firms within Nairobi County. Future studies should replicate this investigation across different counties to enhance the generalizability of the findings and provide insights that are more reflective of diverse operational contexts. Third, given the predominant focus on the manufacturing sector, there is an opportunity for future research to examine other industries, such as banking or retail. This diversification of research focus could yield valuable insights into how green supply chain employee involvement manifests and impacts performance in various sectors. Finally, this study primarily employed quantitative methodologies, which, while useful, may not fully capture the complexities of the relationship between green supply chain employee involvement and firm performance. Future research could benefit from incorporating qualitative methods, such as interviews or case studies, to provide a more holistic understanding of the dynamics at play.

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