Influence of Green Packaging on Performance of Building and Construction Manufacturing Firms in Kenya

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Abstract

The aim of this paper is to establish the influence of green packaging as one of the components of green logistics on the performance of building and construction companies in Kenya. This comes as the call for embrace sustainable development goals across all sectors is on the rise, and most companies stepping in to embrace sustainable practices as a way of minimizing costs, ensuring customer satisfaction, and conserving the environment. The paper has been anchored on the institutional theory. Through cross-sectional research design, the study surveyed 270 respondents drawn from the 54 building and construction manufacturing firms in Kenya. Primary data was collected using a questionnaire. Qualitative data was analyzed through content analysis whereas quantitative data was analyzed through descriptive statistics (mean, standard deviation, frequency and percentages) and inferential statistics (ANOVA, P-value, t-test). The results revealed that green packaging had a significant influence on the performance of the building and construction manufacturing firms in Kenya. The study concluded that through embrace of green packaging, performance of the manufacturing firms was obtained. It is recommended that the management of the building and construction manufacturing firms embraces green packaging for better cost-saving, enhancing customer satisfaction, conserving natural resources and strengthening their competitive edge.

Keywords: Green Logistics, Green Packaging, Building and Construction Manufacturing Firms

1.0 Background of the Study

As the global suppliers of manufactured products, manufacturing enterprises are implementing sustainable solutions such as green logistics management (GLM) for the movement of the goods both to manufacturing industries and customers (Wolf, 2014). The focus is on profitable growth without inflicting environmental damages through pollution to other countries through managing the logistics cycle of their merchandises spanning sourcing, channel deliveries, general distribution and disposal of the waste and default products (Hsueh, 2015). Such a solution are able to key green logistics initiatives enable to improve business performance, while preserving the local environment, as well as the global environment image on the environmental preservation. Many manufacturing companies across the globe are encountering international pressure to maximise on green transport and reduce their environmental consequences the circular economy, which promotes conservation of resources, reflects organizational responsibility towards achieving the green logistics goal (Tseng & Hung, 2014).

According to Hazen and Hanna (2011) green packaging refers to any change made by a product manufacturer or service provider to lessen the environmental-impact of the materials or processes involved in packaging the products and services while their deployment to the end-user. Implementing methods for green packaging include practices such as the use of biodegradable or recycled material, reducing the amount of material used for packing a product or using refillable or reusable packaging containers (Hsueh, 2015).

According to Osmani and Zhang (2014) states that Biodegradable refers to the ability of materials to break down and return to nature. In order for packaging products or materials to qualify as biodegradable, they must completely break down and decompose into natural elements within a short time after disposal typically a year or less. Carter & Easton (2011) the ability to biodegrade within landfills helps to reduce the buildup of waste, contributing to a safer, cleaner and healthier environment. Materials that are biodegradable include corrugated cardboard and even some plastics

Packaging Reduction is structure that doesn't utilize a lot of bundling material. Grasp effortlessness alongside innovativeness to concoct an alluring and moderate structure (Pietro, Huge-Brodin, Isaksson & Sweeney, 2012). Insignificant bundling helps in decreasing material use, prompting diminished item cost. During transportation even devour less vitality to fabricate both the material and bundling and less fuel is utilized to transport things. Reusable containers and boxes are a shipping container with strength suitable to withstand shipment, storage, and handling (Ballot & Fontane, 2010). Shipping containers range from large reusable steel boxes used for intermodal shipments to the ubiquitous corrugated boxes which are designed to be moved from one mode of transport to another without unloading and reloading.

The Kenya Association of Manufacturers (2019) classifies companies that deal with the manufacture and production of building and construction materials under building and construction manufacturing companies. The companies deal with products such as cement manufacturing, manufacture of steel and iron, manufacture of paints and assembling of building materials among other products.

1.2 Statement of the Problem

Despite the merit surrounding the building and construction manufacturing firms in Kenya, the firms have continually recorded a surge decline in performance over the past five years (KAM, 2017). According to KAM report (2017), most of the manufacturing companies in building and construction sector recorded over 15% decline in their annual turnover while the sector lost over 2.8% of its market share between 2013 and 2017. According to the Competition Authority of Kenya (CAK) (2018), building and construction manufacturing companies in Kenya have been facing tough times in the market a matter that has seen most of the companies retrench to save their operational costs. This is despite the continued growth of urban centres and demand for housing and related infrastructure in the country. According to KAM (2020), in the period between 2015 and 2019, close to 45% of the building and construction manufacturing firms had recorded over 26% increase in their annual operational costs, with costs related to supply chain and logistics practices taking up to 48% of these costs. The available evidence therefore shows that despite the surge in high-rise buildings and other mega construction projects in the country, the construction and building manufacturing companies have been poorly performing in the recent past.

Green logistics through green packaging has been considered as a major approach in promoting sustainability of the supply chain management through which organizational performance is enhanced as well as meeting the environment conditions of the modern day World (UNEP, 2018). Empirical studies have revealed mixed results on the relationship between green packaging as an aspect of green logistics and firm performance. Vermeulen (2015) and Qureshi, Rasli and Zaman (2016) found that green packaging is an aspect of green logistics that has a significant influence on the firm performance through cost-saving and enhancing efficiency and effectiveness. Based on the available literature, it is evident that green packaging would be essential in enhancing firm performance. However, there is scant evidence in the Kenyan manufacturing sector, especially in the building and construction manufacturing firms. To this effect, the study sought to establish the influence of green packaging on the on performance of building and construction manufacturing companies in Kenya.

1.3 Objectives of the Study

i. To determine the effect of green packaging on performance of building and construction manufacturing firms in Kenya

1.4 Research Hypotheses

1. H_{A2}: Green packaging has a significant effect on the performance of building and construction manufacturing firms in Kenya

2.0 Theoretical Review

This research paper was informed by the institutional theory. The theory emphasizes the role of social and cultural pressures subjected to organizations that influence management practices. DiMaggio (2008) argues that managerial decisions are strongly influenced by three institutional mechanisms namely; coercive, mimetic and normative isomorphism - that creates and diffuses a common set of values, norms and rules to produce similar practices and structures across organizations that share a common organizational field.

Delmas and Toffel (2014) proposed an institutional perspective to analyze the drivers of green packaging and also came up with how distinct levels of coercive pressures are exerted upon different industries which may lead to different environmental strategies. Firms tend to adopt green logistics management practices in response to institutional pressure. They can be based on; natural methodologies of conformance that attention on consenting to guidelines and embracing standard industry practice, or to

lessen ecological effect of tasks past administrative necessities (Sharma, 2010). This includes areas such as recycling and refurbishment, returns policy and remanufacturing.

Management can also include green packaging as a performance indicator in green logistics management (Nelson & Winter, 2012). Firms can create relationships with regulators and signal a proactive environmental stance by participating in government sponsored voluntary programs (Delmas & Toffel, 2014). Construction companies can also work with their customers and suppliers to improve their green packaging through better green logistics management (Nelson & Winter, 2012). For the construction firm to achieve the best in enhancing green packaging, it ought to collaborate with suppliers and regulators hence the essence of institutional theory. The theory, therefore informed the study on green packing as an aspect of green logistics.

2.1 Conceptual Framework

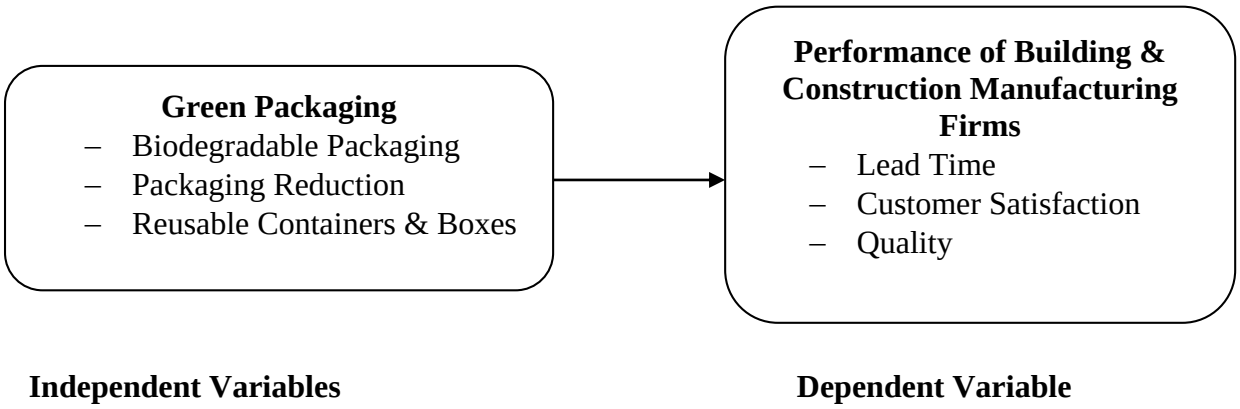

Figure 1: Conceptual Framework

2.2 Review of Empirical Literature

Chen and Delmas (2011) while analyzing the factors influencing the adoption of green practices within the logistics industry investigated green practices including the adoption of fuel efficient vehicles, electricity management systems and solar energy systems. The scholars analysed and surveyed three hundred and twenty two (322) logistics firms in China's Shanghai and Shenzhen areas. The study also explored the roles of organizational factors such as the firms' size and the quality of their human-resources systems, for example. The business context, pressure from customers or the government and uncertainty in the business setting and technological factors were found to be among the key aspects influencing the adoption of green logistics (Chen & Delmas, 2011). Technological factors, such as the relative benefits of new technologies and innovations, how well suited they are to a firm's needs and how easy they are to understand and use, are a relatively new focus for research. Queuing models provide closed form results and approximations for certain congested service systems, although under assumptions that may differ substantially from actual operating conditions.

The studies further established that analysis of routing and assignment heuristics in idealized systems yields insight into asymptotic and worst-case performance, which may not be of direct relevance to actual operating conditions. Such conditions can be represented effectively in a computer simulation modelling framework, which provides the requisite flexibility of strategy representation and complex process emulation for the evaluation of dynamic green distribution systems. Carrier operations in response to demands for service can be examined over periods of varying duration, providing a test-bed for the design and performance evaluation of real-time operational strategies consisting of load acceptance, assignment, routing, and scheduling techniques. In addition to mean performance, evaluation through simulation readily can yield results regarding performance variability, reliability, robustness under stochastic events, and other measures.

3.0 Methodology

3.1 Research Design

The study used a cross-sectional research design. This design incorporates collection and analysis of cross-sectional data which according to Kothari (2014); enables intensive collection of in-depth data for the purpose of responding to the research questions. The cross-sectional research design will therefore be adopted to enable the use of a linear and multiple regression model to assess the relationship between green packaging and performance building and construction manufacturing firms in Kenya.

3.2 Target Population and Sampling

The target population for the study comprised of the building and construction manufacturing firms registered with under the Kenyan Association of Manufacturers. As of December 2020, there were 54 building and construction manufacturing firms registered under KAM. The firms deal with manufacture of building and construction materials and accessories including cement, glassware, steel and iron materials, precast and ready-mix concrete, and quarry construction and building materials.

The sampling frame was the 54 building and construction manufacturing firms in Kenya, as enlisted by the Kenya Association of Manufacturers. The unit of observation was the employees from the 54 building and construction manufacturing firms companies. According to KAM, the firms have employed over 6,000 employees. However, there are 900 senior management and administrative staff in the sector. These were the target population for the study from which the target population was obtained.

The study used a census to identify the units of analysis. This is where all the 54 building and construction manufacturing companies were included in the study. A purposive sampling was used to identify the units of observation, where the heads of 5 key departments involved the logistics processes and related activities were purposively selected. This implies that in every firm, 5 respondents were drawn, making the sample size to be 270 respondents which is 30% of the target population (900).

3.3 Data Collection and Analysis

This study used primary data which was collected using a structured questionnaire. The questionnaire was deemed appropriate due to its ability to collect a wide range of data and cover a high number of respondents within a reasonable period of time. The questionnaire was administered both manually (physically) and through online means.

Descriptive statistics such as frequency distributions and percentages were used to summarize basic features of the data in the study. Inferential statistics were used in computation of: the confidence levels to be applied; Normality test, test for heteroscedasticity, correlation matrix; and the multiple regression process for testing of the hypothesis (Saunders & Thornhill, 2009). The Statistical Package for Social Sciences (SPSS) version 26.0 was used to perform the analysis of quantitative data. A regression model was developed to present the relationship between the variables.

The multiple regression model was:

$$Y = \alpha + \beta_1 X_1 + \varepsilon$$

Where:
Y = Performance of Building and construction manufacturing firms
α = the Constant
β_1 = the coefficient of the independent variable
X_1 = Green packaging
ε is the error term established from heteroscedasticity test;

4.0 Research Findings

4.1 Response Rate

Out of the sample size of 270 respondents, the study obtained a response rate of 84.4% where 228 dully filled questionnaires were returned for analysis. This was considered adequate for the study, since it was above the recommended response arte of 60% (Kothari, 2014) and Creswell, 2016).

4.2 Descriptive Results on the Influence of Green Packaging on Firm Performance

The study sought to establish the influence of green packaging on the performance of construction companies in Kenya. The main sub-variables for the green packaging were: biodegradable packaging, reduction of the packaging materials and use of reusable containers and boxes in packaging. The respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from these aspects. A 5-points Likert's scale was used. The findings are as summarized in Table 1. The findings portray that green packaging has not been effectively upheld among most of the building and construction manufacturing firms, and this could affect the performance of the companies.

Table 1: Descriptive Statistics on Green Packaging

Statements	Mean	Std. Dev.
The organization applies packaging made of recyclable materials enhancing quality of goods	2.58	1.28
The organization packaging materials are bio-degradable	2.59	1.34
The organization uses minimum transportation packaging materials to preserve the natural resources which has reduced the cost of transportation	3.39	1.20
Post-consumer recycled polyethylene bags made from recycled waste are used in our firm	2.84	1.51
The organisation uses renewable resource based packaging materials	2.58	1.43
The organization uses minimum possible packaging materials to save on costs	3.03	1.46
The materials used in packaging help to preserve the natural state of the products	2.66	1.47
The resources used in packaging enhances the delivery of goods in their original state	2.77	1.46
The company has enhanced packaging optimization by packaging reduction, while retaining product protection	2.67	1.41
Our organisation uses packaging with additives added in order to make the packaging degradable	2.53	1.36
Use of eco-friendly packaging material - without sacrificing appearance and quality is embraced in our organization	3.21	1.26

4.3 Descriptive Results on Firm Performance

The study sought to find out the opinions of the respondents regarding the performance of their respective building and construction manufacturing firms. They were asked to indicate their level of agreement or disagreement on specific statements on organizational performance based on a 5-points Likert's scale. The findings are as summarized in Table 2. The results imply that the performance of the construction companies has not been effective, thus raising the need for green logistics to boast their cost saving, enhancement of quality and meeting customer satisfaction.

Table 2: Descriptive Statistics on Firm Performance

Statements	Mean	Std. Dev.
Our company has drastically reduced the rate of customer returns over the past five years	2.68	1.00
The cost of operations in our firm has reduced for the past five years	2.50	1.23
Our company has seen an increase in the sales revenue for the past five years	2.89	1.07
There are fewer customer complaints with regard to our products over the past five years	3.18	1.10

4.4 Inferential Analysis Results

4.4.1 Correlation Analysis

Correlation analysis was carried out to establish the relationship between green packaging and the performance of building and construction firms in Kenya. The results as shown in Table 3 revealed that the Pearson Correlation (r) on the relationship between green packaging and firm performance was 0.667, at a significant level of 0.000<0.05. The findings imply that green packaging has a significant and strong correlation with the performance of building and construction manufacturing firms in Kenya.

Table 3: Correlation Results between Green Packaging and Performance

		Firm Performance	Green Packaging
Firm Performance	Pearson Correlation	1	.667**
	Sig. (2-tailed)		.000

	N	228	228
	Pearson Correlation	.667**	1
Green Packaging	Sig. (2-tailed)	.000	
	N	228	228

4.4.2 Regression Analysis

The study adopted alternative hypotheses, which were tested using regression model.

H_{A1}: Green packaging has a significant effect on the performance of building and construction manufacturing firms in Kenya

The study sought to establish the influence of green packaging on the performance of building and construction manufacturing firms in Kenya. The model summary as shown in Table 4 revealed that the R^2 for the model was 0.444. This implies that as a result of green packaging, the variation of performance of building and construction manufacturing firms will be 44.4%. This is an indication that green packaging has a strong influence on the performance of building and construction manufacturing firms in Kenya.

The ANOVA test results for the model revealed that the F-statistic for the model was 180.641 at a significant level of 0.000<0.05. This implies that the model is significant in predicting the effect of green packaging and firm performance. It also shows that there is a possibility of a significant relationship between the variables.

The regression coefficients for the model on the relationship between green packaging and firm performance revealed that the Beta coefficient for green packaging is 0.620. This implies that a unit change in green packaging would influence the performance of the building and construction firms by 0.62 units. The significant level for the variable is 0.000<0.05. This implies that there is a significant

Table 4: Regression Analysis Results on the Influence of Green Packaging on Firm Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.667[a]	.444	.442	.41885

a. Predictors: (Constant), Green Packaging

ANOVA Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.690	1	31.690	180.641	.000[b]
	Residual	39.648	226	.175		
	Total	71.338	227			

a. Dependent Variable: Firm Performance
b. Predictors: (Constant), Green Packaging

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.160	.144		8.039	.000
	Green Packaging	.620	.046	.667	13.440	.000

a. Dependent Variable: Firm Performance

4.5 Discussion of the Findings

The study sought to assess the effect of green packaging on the performance of building and construction manufacturing firms in Kenya. The descriptive results of the study revealed that most of the manufacturing firms surveyed did not apply packaging made of recyclable materials, despite this being a major way of enhancing the quality of goods. Most of the organizations also did not embrace packaging materials that were biodegradable. The findings further revealed that the surveyed firms used minimum transportation packaging materials which is a way of preserving the natural resources and reduce the cost of transportation. The firms however did not embraced use of post-consumer polyethylene materials to package their goods and also embrace of renewable resources in packaging was minimal. The respondents further disagreed that their respective firms used packaging materials that helped to preserve the natural state of the products and the materials used in packaging enhanced the delivery of goods in their original state. Most of the companies did not enhance packaging optimization through reduction of packaging and retaining product protection, and this could mean that increased costs and lack of proper protection in the products was high. The respondents further noted that their respective firms did not actively use eco-friendly packaging materials, an indication that the building and construction manufacturing firms could be actively contributing to environmental pollution through unsustainable packaging practices thus not benefiting from reduced costs and enhanced customer satisfaction. The results from the regression model on the other hand revealed that green packaging had a significant and positive effect on the performance of building and construction manufacturing firms in Kenya. This was both when regressed alone through univariate regression analysis and when regressed with other variables on green logistics through multivariate regression model.

5.1 Conclusions of the Study

The study concluded that green packaging as one of the aspects of green logistics play a significant role in promoting the performance of building and construction manufacturing firms in Kenya. The use of biodegradable packaging materials and reducing the materials used in packaging are essential way through which the manufacturing firms can embrace green sustainable logistics practices. These practices despite saving on operation costs, they also enhance the satisfaction of customers and enhance the public image of the companies. The study concludes that the use of green packaging through promotion of reusable containers in packaging enhances recycling among the customers thus promoting a greener environment. Moreover many customers would prefer products from a company that packages its products with reusable packages, which is to the advantage of the manufacturing entity.

5.2 Recommendations of the Study

Packaging is one of the crucial processes in the logistics practices of the manufacturing firms, particularly those in the building and construction sub-sector. It is recommended that the management of the building and construction manufacturing firms steps up to ensure that the packaging of their products is done in a more sustainable manner such that conserves the environment. Through use of biodegradable materials to package, and ensuring the packages used are reusable, the customers are attracted to such products and this would mean enhanced performance of the firms. The management should require that those in charge of packaging minimize the materials used in packaging while ensuring that the quality of the products is not compromised. This ensures that as the company is upholding green logistics practices, the costs of packaging are minimized as well.

Embrace of green logistics through green packaging is one of the sustainable business practices among the organizations in the country that remains a blueprint for the government as one of the sustainable development goals. The government therefore ought to incorporate policing and governance framework that provide guidance to the manufacturing firms on how to embrace green logistics as one of the sustainable practices. The government through key arms such as the parliament should come up with policies that highlight the key green logistics practices to be adopted by the building and construction manufacturing firms.

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