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**Procurement Best Practices and Sustainable Supply Chain Performance of
Plastic and Rubber Manufacturing Firms in Kenya**



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Procurement Best Practices and Sustainable Supply Chain Performance of Plastic and Rubber Manufacturing Firms in Kenya



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Abstract

Purpose: The study aimed at assessing procurement best practices and sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya.

Methodology: Descriptive research design was adopted by the study. A total of 167 plastic and rubber manufacturing firms in Kenya was the target population, as indicated by KAM (2022) directory. This study used census, as a rule of thumb for population below 200. To gather data, structured questionnaires were used to collect data. Once collected, data was analyzed using descriptive and inferential statistics. Quantitative data was analysed using multiple regression analysis. The qualitative data generated was analyzed by use of the Statistical Package of Social Sciences (SPSS) version 21.

Findings: In this study multivariate regression analysis was used to determine the significance of the relationship between the dependent variable and all the independent variables pooled together. Regression analysis was conducted to find the proportion in the dependent variable which can be predicted from the independent variables. The current study obtained an R^2 of 64.7% and should therefore be expanded further in future in order to include other procurement best practices that may as well have a positive significance to the sustainable supply chain performance of plastic and rubber manufacturing firms. The findings of the study indicated that reverse logistics management, procurement outsourcing, e-procurement and green procurement have a positive relationship with sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya.

Unique contribution to theory, practice and policy: The study recommended that institutions should embrace procurement best practices so as to improve sustainable supply chain performance and further research should be carried out in other institutions to find out if the same results can be obtained.

Key Words: *Reverse Logistics Management, Procurement Outsourcing, E-Procurement and Green Procurement*

1.1 Introduction

Procurement is audited to verify whether there was an actual need for a given acquisition. Procurement best practices are considered an important catalyst in the performance of company's world over. This is why the procurement best practices concept has captured the attention of all sides of commerce and industry, as well as that of academics. The large number of academic articles being published in this area is a testimony to the high level of interest in best practices issues (Analytica, 2022). During the past decade, procurement best practices have become one of the most important organizational strategies for achieving competitive advantage. Improving the procurement best practices with which an organization can deliver its products and services is critical for competing in an expanding global market. Procurement best practices begin with the primary assumption that employees in organizations must cooperate with each other in order to achieve the needs of the customer. One can achieve this by controlling manufacturing/service processes to prevent defects (David & Robert, 2021). The direct link of operational efficiency and particularly the supply chain, to the overall organizational performance therefore makes the adoption of best practices crucial to today's organizational success. The study of procurement best practices and how they can be effectively integrated into the organizational strategy is therefore valuable to today's business leaders (Kenneth, Lysons & Farrington, 2022).

In today's economic environment doing what you have always done even if you are to do it very well is no longer acceptable, under pressure to contain both costs and produce results despite challenging circumstances, supply managers must transform rather than simply improve your operation. That means adopting the philosophies, methods and processes that will make your organization best in class (Mann & Zhang, 2019). What makes an organization best in class will vary from each company but there are strategies that leading companies are adopting. Procurement represents a stage in evolution of civilized human relationships since it enables a desired object to be obtained by training rather than conquest, plunder or justification (Masters, 2020). Despite the large number of articles and books on best practices, procurement best practices remain a hazy, ambiguous concept. Various teams provide companies with the structured environment necessary for successfully implementing and continuously applying the best practices process (Al- Mashari & Zairi, 2019). Best practices training are conducted and the improvement of processes executed through a well-planned team structure. The ultimate goal of the team approach is to get everyone, including contractors, designers, vendors, subcontractors, and owners involved.

1.2 Statement of the Problem

The manufacturing sector contributes on average 12% of Kenya's GDP. Its significance to Kenya's economy and growth cannot be overlooked (KIPPRA, 2022). Despite the complexity and length of manufacturing firms' supply chains, continuous improvement and procurement best practices are key to the sustainability and overall performance of the firm in a competitive environment. However, this desired optimality in procurement best practices and performance is seldom attained (World Bank, 2021). Procurement best practices is therefore paramount to

any organization since it leads to improved product design, quality and cost consciousness, which means an improvement in the sustainable supply chain performance of a firm.

Statistics from OECD show that large scale manufacturers operating in Kenya registered stagnation and declining profits for the last five years due to a turbulent operating environment as well as lacking procurement best practices in their respective supply chains (OECD, 2020). It is estimated that large manufacturing firms have lost 70% of their market share in East Africa largely attributed to lack of procurement best practices issues (PPRA, 2021). In 2019, manufacturing sector in Kenya contributed barely 6% to the GDP which represented Sh.537 Billion indicating a decline from the previous year 2018 where it had reported a 10% due to disruptions in supply chains, a challenging operating environment and high operational costs (KNBS, 2020).

Several studies have been done, however these studies have used different methodological approaches for instance a study by Mouelhi (2018) used firm level panel data to examine the extent to which the use of information and communication technology has contributed to efficiency growth in Turkish manufacturing firms while Jekel (2019) used generalized least square regression model in a study on the quality aspect of dynamic capabilities based on successful practices of Japan manufacturing firms. This presents methodological research gaps in the previous studies conducted on the topic. It is therefore inadequate to merely analyse firm's performance by financial performance especially under today's changing operating environment using a different methodology from the previous studies (Qi, 2020). From these studies both global and local, no empirical research has been undertaken to reliably quantify the influence of procurement best practices on sustainable supply chain performance of plastic and rubber manufacturing firms. It is against this backdrop that this study intends to look at procurement best practices and sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya.

1.3 Objectives of the Study

- i) To assess the influence of reverse logistics management on sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya.
- ii) To establish the influence of procurement outsourcing on sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya.
- iii) To determine the influence of e-procurement on sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya.
- iv) To evaluate the influence of green procurement on sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya

2.0 Literature Review

2.1 Theoretical Review

2.1.1 Partnership Theory

In supply chain, the common model through which theorists study the relationship between supplier and buyer is known as the partnership theory. In its basic nature, the partnership model depicts the buyer and supplier as partners with a common interest which is customer satisfaction (Thai, 2020). Partnership is a business relationship based on mutual trust openness, shared risks and rewards that enables an organization gain competitive advantage leading in the company achieving a performance that's far much greater than the firm would have achieved when operating as single entities (Strickland, 2021). This model requires efficient information exchange between the buyer and supplier which is a critical element of any partnership (Steinhilber, 2021). The theory further states that any partnership is always based on value and present for each other. The solid and long term relationship simply implies continuous improvement of the organization performance. Suppliers must provide better services that are of high quality than his competition at a price reasonable and still achieve goals to remain in business, therefore engaging in reverse logistics management, procurement outsourcing, e-procurement and green procurement is common.

Partnership model according to Taiwo and Idumo (2019), increases company efficiency through way of cooperative; both parties obtain cost reduction which leads to price reduction and therefore increasing the market share profit margin as well. This leads to a company gaining a competitive edge and efficiency. The character which forms the perceived attributes of partnership include the following; high frequency of both formal and informal communication, cooperative attitude, trusting relations are built, problem solving that is win negotiation style, long term business agreement, reverse logistics management, procurement outsourcing, e-procurement and green procurement, open sharing of information and there is always vendor certification and defect prevention approach. Motivation factors, environment of operation, strength of operation and duration of operation vary in different partnership formed. However, there is never an ideal relationship that is recommended (Rudzki & Trent, 2020).

There are three types of partnership; which is the most used. Companies recognize each other as partners, all the activities are coordinated, and planned is short term. Only one division within the organization is involved. The second type is partnership which basically integrates activities rather than coordinating as in the case for type 1. There are multiple division and entails a long term horizon. The last type of partnership is the partnership which is not used frequently. Companies share high operational integration such as procurement outsourcing and each views the others as an extension of their firm (Roemer, 2021). The partnership theory has three elements which are drivers, facilitators' and used components. The drivers each party must have a driver strong enough to provide them with realistic expectation of significance benefit through strengthening of the relationship. Facilitators on the other have included corporate compatibility, mutuality, managerial philosophy and techniques and symmetry (Paul,

2020). The final element is the components which are the factors than can be controlled in a partnership by the management. They include planning, joint operating controls, communications, green procurement, risk/reward sharing, trust and commitment, contract style, scope and reverse logistics management (Lewis & Roehrich, 2020). In conclusion in order to gain leadership position against your competitors and ensure the company grows, partnerships can be used to achieve the above.

2.2 Procurement Best Practices

2.2.1 Reverse Logistics Management

Reverse logistics management has been defined as the term used to refer to the role of logistics in product returns, source reduction, recycling, materials substitution, reuse of materials, waste disposal, and refurbishing, repair and remanufacturing (Ahire & Dreyfus, 2019). The idea is to eliminate or minimize waste (energy, emissions, chemical/hazardous and solid wastes). The initiatives that an organization chooses to follow between the various logistics functions as reverse logistics and environmental considerations will have an impact on the performance of that organization (Amaoko & Samuel, 2020). In an eco-transportation system, there are parameters like fuel sources, infrastructure, operational practices and organization of the transport system. These parameters and the dynamics that connect them determine the environmental impact generated in the transportation logistics phase of the supply chain (Amit, 2021).

2.2.2 Procurement Outsourcing

Procurement outsourcing is a common practice among both private and public organizations and is a major element in business strategy (Drees & Heugens, 2020). Perhaps most organizations now outsource some of the functions they used to perform themselves. Due to widespread procurement outsourcing practices, it has become a frequent topic in the literature. Numerous reasons why procurement outsourcing is initiated have been identified by researchers. Organizations may expect to achieve many different benefits through successful procurement outsourcing, although there are significant risks that may be realized if procurement outsourcing is not successful (Hatry, 2020).

2.2.3 E-Procurement

E-procurement has been defined as the use of internet-based (integrated) information and communication technologies to carry out individual or all stages of the procurement process including search, sourcing, negotiation, ordering, receipt, and post-purchase review (Croom & Brandon, 2021). According to Laryea and Ibem (2022) competitiveness in today's marketplace depends closely on the ability of a firm to grip the challenges of reducing lead-time, cost estimation, increasing customer service levels and improving product quality.

2.2.4 Green Procurement

Green procurement is the use of environmental friendly processes in supply chain management and it relates to ensuring that the supply chain management processes are friendly when it

comes to the natural environment (Handfield, Sroufe & Walton, 2018). Green procurement processes involves the use of environmentally friendly raw materials and incorporating green processes from the supplier of raw materials, manufacturers and to the end user of the product (Zsidisin & Siferd, 2022). Green procurement is made up of several dimensions including eco design, investment recovery, external environmental management and internal environmental management. Environmental supply chain management, environmental purchasing, green purchasing, and green value chain and green supply chain practices (Vachon & Klassen, 2021). Green procurement consists of the purchasing function's involvement in activities that include waste reduction, recycling, reuse and the substitution of materials (Zhu, 2018).

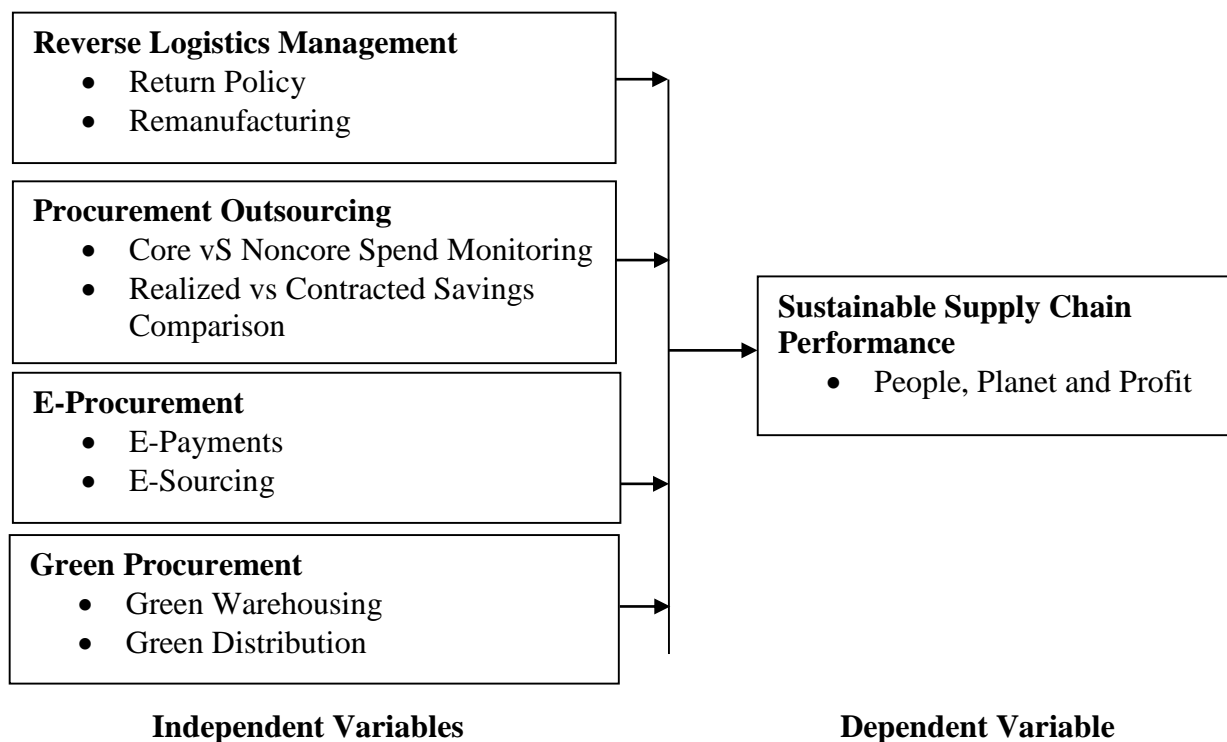


Figure 1: Conceptual Framework

3.0 Methodology

The study reviewed both theoretical and empirical literature and then propose the research methodology that addressed the gaps identified in literature as well as to validate the research questions. The study employed descriptive research design, targeting heads of procurement in plastic and rubber manufacturing firms. A total of 167 plastic and rubber manufacturing firms in Kenya was the target population, as indicated in KAM (2022) directory. This study used census, as a rule of thumb for population below 200. To gather data, structured questionnaires were used to collect data. Once collected, data was analyzed through descriptive statistical methods such as means, standard deviation, frequencies and percentage. Inferential analyses were used in relation to correlation analysis and regression analysis to test the relationship between the four explanatory variables and the explained variable. Multiple regression models were used to show the relationship between the predicted variable and the predictor variables. The data generated was keyed in and analyzed by use of Statistical Package of Social Sciences

(SPSS) version 26 to generate information which was presented using charts, frequencies and percentages. The research used a multiple regression model.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

Y = Sustainable Supply Chain Performance

β_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Beta Coefficients

X_1 = Reverse Logistics Management

X_2 = Procurement Outsourcing

X_3 = E-Procurement

X_4 = Green Procurement

ε = Error Term

4.0 Results Findings

4.1 Response Rate

A sample of respondents were interviewed using questionnaires that allowed the researcher to drop the questionnaire to the respondents and then collect them at a later date when they had filled the questionnaires. A total of 167 questionnaires were distributed to heads of procurement. Out of the population covered, 104 were responsive representing a response rate of 62%. This was above the 50% which is considered adequate in descriptive statistics according to (Kothari, 2014).

Table 1: Response Rate of Respondents

Response	Frequency	Percentage, %
Actual Response	104	62
Non-Response	63	38
Total	167	100%

4.2 Pilot Study

The Cronbach's alpha was computed in terms of the average inter-correlations among the items measuring the concepts. The rule of thumb for Cronbach's alpha is that the closer the alpha is to 1 the higher the reliability (Dunn, 2019). A value of at least 0.7 is recommended. Cronbach's alpha is the most commonly used coefficient of internal consistency and stability. Consistency indicated how well the items measuring the concepts hang together as a set. Cronbach's alpha was used to measure reliability. This was done on the four objectives of the study. The higher the coefficient, the more reliable is the test.

Table 2: Reliability Results

Variable	No. of Items	Respondents	α =Alpha	Comment
Reverse Logistics Management	9	17	0.893	Reliable
Procurement Outsourcing	9	17	0.987	Reliable
E-Procurement	9	17	0.974	Reliable
Green Procurement	9	17	0.976	Reliable

4.3 Correlation Analysis

Correlation analysis was used to determine both the significance and degree of association of the variables and also predict the level of variation in the dependent variable caused by the independent variables in table 3.

Table 3: Summary of Pearson's Correlations

Correlations		Reverse Logistics Management	Procurement Outsourcing	E-Procurement	Green Procurement	Sustainable Supply Chain Performance
Reverse Logistics Management	Pearson Correlation Sig. (2-Tailed)	1				
Procurement outsourcing	Pearson Correlation Sig. (2-Tailed)	.263**	1			
E-Procurement	Pearson Correlation Sig. (2-Tailed)	.350**	.346**	1		
Green Procurement	Pearson Correlation Sig. (2-Tailed)	.363**	.516**	.543**	1	
Sustainable Supply Chain Performance	Pearson Correlation Sig. (2-Tailed)	.509**	.398**	.678**	.685**	1

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

Correlation analysis was used to determine both the significance and degree of association of the variables and also predict the level of variation in the dependent variable caused by the independent variables. The correlation summary shown in Table 3 indicates that the associations between each of the independent variables and the dependent variable were all significant at the 95% confidence level. The correlation analysis to determine the relationship between procurement best practices affecting and sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya. Pearson correlation coefficient computed and tested at 5% significance level. The results indicate that there is a positive relationship ($r=.509$) between reverse logistics management and sustainable supply chain performance of plastic and

rubber manufacturing firms in Kenya. In addition, the researcher found the relationship to be statistically significant at 5% level ($p=0.000$, <0.05).

The results also indicate that there is a positive relationship ($r=.398$) between procurement outsourcing and sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya. In addition, the researcher found the relationship to be statistically significant at 5% level ($p=0.000$, <0.05). The results indicate that there is a positive relationship ($r=.678$) between e-procurement and sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya. In addition, the researcher found the relationship to be statistically significant at 5% level ($p=0.000$, <0.05). The results indicate that there is a positive relationship ($r=.685$) between green procurement and sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya. In addition, the researcher found the relationship to be statistically significant at 5% level ($p=0.000$, <0.05). Hence, it is evident that all the independent variables could explain the changes in sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya, on the basis of the correlation analysis.

4.4 Regression Analysis

In this study multivariate regression analysis was used to determine the significance of the relationship between the dependent variable and all the independent variables pooled together. Regression analysis was conducted to find the proportion in the dependent variable (sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya) which can be predicted from the independent variables (reverse logistics management, procurement outsourcing, e-procurement, green procurement). Table 4 presents the regression coefficient of independent variables against dependent variable. The results of regression analysis revealed there is a significant positive relationship between dependent variable and the independent variable.

The independent variables reported R value of .805a indicating that there is perfect relationship between dependent variable and independent variables. R square value of 0.647 means that 64.7% of the corresponding variation in sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya can be explained or predicted by (reverse logistics management, procurement outsourcing, e-procurement, green procurement) which indicated that the model fitted the study data. The results of regression analysis revealed that there was a significant positive relationship between dependent variable and independent variable at ($\beta = 0.647$), $p=0.000 <0.05$).

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.805 ^a	.647	.633	.166295

a) Predictors: (Constant), Reverse Logistics Management, Procurement Outsourcing, E-Procurement, Green Procurement

b) Dependent Variable: Sustainable Supply Chain Performance of Plastic and Rubber Manufacturing Firms

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.027	4	1.257	45.449	.000 ^b
	Residual	2.738	99	0.028		
	Total	7.765	103			

a) Predictors: (Constant), Reverse Logistics Management, Procurement Outsourcing, E-Procurement, Green Procurement

b) Dependent Variable: Sustainable Supply Chain Performance of Plastic and Rubber Manufacturing Firms

The significance value is 0.000 which is less than 0.05 thus the model is statistically significant in predicting how reverse logistics management, procurement outsourcing, e-procurement, green procurement influence sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya. The F critical at 5% level of significance was 26.5. Since F calculated which can be noted from the ANOVA table above is 45.449 which is greater than the F critical (value= 26.5), this shows that the overall model was significant. The study therefore establishes that; reverse logistics management, procurement outsourcing, e-procurement, green procurement were all important procurement best practices influencing sustainable supply chain performance of plastic and rubber manufacturing firms. These results agree with Rotich (2020) results which indicated a positive and significant influence of procurement best practices on sustainable supply chain performance of manufacturing firms.

Table 6: Coefficients of Determination

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.353	0.202		11.619	0.000
	Green Procurement	0.183	0.037	0.392	4.948	0.000
	Reverse Logistics Management	0.158	0.045	0.232	3.546	0.001
	E-Procurement	0.121	0.023	0.383	5.272	0.000
	Procurement Outsourcing	0.001	0.036	0.001	0.021	0.040

a) Predictors: (Constant), Reverse Logistics Management, Procurement Outsourcing, E-Procurement, Green Procurement

b) Dependent Variable: Sustainable Supply Chain Performance of Plastic and Rubber Manufacturing Firms

The research used a multiple regression model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

The regression equation will be;

$$Y = 2.353 + 0.183X_1 + 0.158X_2 + 0.121X_3 + 0.001X_4$$

The regression equation above has established that taking all factors into account (reverse logistics management, procurement outsourcing, e-procurement, and green procurement) constant at zero, sustainable supply chain performance of plastic and rubber manufacturing firms in Kenya will be an index of 2.353. The findings presented also shows that taking all other independent variables at zero, a unit increase in reverse logistics management will lead to a 0.158 increase in sustainable supply chain performance of plastic and rubber manufacturing firms. The P-value was 0.001 which is less 0.05 and thus the relationship was significant. The study also found that a unit increase in procurement outsourcing will lead to a 0.001 increase in sustainable supply chain performance of plastic and rubber manufacturing firms. The P-value was 0.04 and thus the relationship was significant. In addition, the study found that a unit increase in e-procurement will lead to a 0.121 increase in sustainable supply

chain performance of plastic and rubber manufacturing firms. The P-value was 0.000 and thus the relationship was significant. Lastly, the study found that green procurement will lead to a 0.183 increase in sustainable supply chain performance of plastic and rubber manufacturing firms. The P-value was 0.000 and hence the relationship was significant since the p-value was lower than 0.05. The findings of the study show that, green procurement contributed most to sustainable supply chain performance of plastic and rubber manufacturing firms.

5.0 Summary, Conclusion and Recommendations

5.1 Summary of Findings

Based on the study findings, the study concludes that sustainable supply chain performance of plastic and rubber manufacturing firms can be improved by reverse logistics management, procurement outsourcing, e-procurement, and green procurement. First, in regard to green procurement, the regression coefficients of the study show that it has a significant influence of 0.183 on sustainable supply chain performance of plastic and rubber manufacturing firms. This implies that increasing levels of green procurement by a unit would increase the levels of sustainable supply chain performance of plastic and rubber manufacturing firms by 0.183. This shows that green procurement has a positive influence on sustainable supply chain performance of plastic and rubber manufacturing firms. Second in regard to reverse logistics management, the regression coefficients of the study show that it has a significant influence of 0.158 on sustainable supply chain performance of plastic and rubber manufacturing firms. This implies that increasing levels of reverse logistics management by a unit would increase the levels of sustainable supply chain performance of plastic and rubber manufacturing firms by 0.158. This shows that reverse logistics management has a positive influence on sustainable supply chain performance of plastic and rubber manufacturing firms.

With regard to e-procurement, the regression coefficients of the study show that it has a significant influence of 0.121 on sustainable supply chain performance of plastic and rubber manufacturing firms. This implies that increasing levels of e-procurement by a unit would increase the levels of sustainable supply chain performance of plastic and rubber manufacturing firms by 0.121. This shows that e-procurement have a positive influence on sustainable supply chain performance of plastic and rubber manufacturing firms. Lastly, in regard to the fourth objective, the regression coefficients of the study show that it has a significant influence of 0.001 on sustainable supply chain performance of plastic and rubber manufacturing firms. This implies that increasing levels of procurement outsourcing by a unit would increase the levels of sustainable supply chain performance of plastic and rubber manufacturing firms by 0.001. This shows that procurement outsourcing has a positive influence on sustainable supply chain performance of plastic and rubber manufacturing firms.

5.2 Conclusions of the Findings of the Study

Based on the study findings, the study concludes that sustainable supply chain performance of plastic and rubber manufacturing firms can be improved by reverse logistics management, procurement outsourcing, e-procurement, and green procurement. Drawing on this research, lack of reverse logistics management, procurement outsourcing, e-procurement, and green

procurement in plastic and rubber manufacturing firms is leading to poor sustainable supply chain performance of plastic and rubber manufacturing firms. Though the plastic and rubber manufacturing firms are striving hard to improve their performance there are still issues of poor quality products, long lead time and high cost of projects. It was articulated that the current phenomenon of poor sustainable supply chain performance of plastic and rubber manufacturing firms can be reversed if the firms and other stakeholders ensure reverse logistics management; procurement outsourcing, e-procurement, and green procurement are embraced in the procurement function.

5.3 Recommendations and Further Research

The study recommended that the management of the plastic and rubber manufacturing firms ought to ensure procurement best practices are well applied in their manufacturing processes to improve their sustainable supply chain performance and further research should to be carried out in other manufacturing firms to find out if the same results can be obtained.

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