

EFFECT OF GREEN PROCUREMENT STRATEGIES ON PERFORMANCE OF TEA PROCESSING FIRMS IN KENYA; A CASE STUDY OF SELECTED KDTA MANAGED FACTORIES IN KISII COUNTY

Sagini Obed Michieka
Master of Science in Procurement and Logistics,
Jomo Kenyatta University Of Agriculture and Technology

Professor Willy Muturi (PHD)
Lecturer, Jomo Kenyatta University of Agriculture and Technology

Abstract

Green Procurement has become very steadily one of the aspects of managerial practices that assimilate environmental matters into the issue of supply chain management. This study sought to investigate the effects of Green procurement practices on performance of selected tea processing factories in Kisii County, Kenya. The study objectives were to: establish the effect of green supplier selection on performance selected tea processing factories, determine the effect of green manufacturing on performance of selected tea processing factories, examine the effect of reverse logistics on performance of selected tea processing factories and evaluate the effect of green distribution on performance of selected tea processing factories in Kisii County, Kenya. The study used descriptive research design. This study used census method thus 96 respondents were considered. The study employed the use of questionnaires as the principle data collection tool to collect views from the respondents. The collected data was analyzed using both qualitative and quantitative techniques to ensure triangulation. Qualitative data was analyzed using thematic data analysis taking into account common words, phrases, themes and patterns in order to enhance understanding (content analysis) in line with the study objectives. The quantitative data was subjected to descriptive statistics. The study found out that; enhanced supplier development through green supplier selection is one of the effects of green supplier selection on performance selected tea processing factories in Kisii County, on the other hand, the study found out that increased quality environment through friendly supplier selection, improved customer service through green supplier selection, improved supplier relationship through green supplier selection and improved total cost of owning are other effects of green supplier selection on performance selected tea processing factories in Kisii County. Reduction of product impact within the supply chain is one of the effects of green manufacturing on performance of selected tea processing factories in Kisii County, similarly;

the study established that the use of biodegradable materials ,use fast and reliable energy for efficient production, high output and low pollution and recycling raw materials and use of biodegradable sources are other effects of green manufacturing on performance of selected tea processing factories in Kisii County. The study revealed that, transportation and logistical, fast delivery and door delivery are other effects of green distribution on performance of selected tea processing factories in Kisii County. The study recommends that green procurement should be used to enhance performance.

Keywords: Green Procurement, supplier selection, green manufacturing, reverse selection.

I. INTRODUCTION

1.1 Background of the study

Walker *et al.*, (2008), observed that attributable to regulations or a renewed awareness of the ills to the environment, state organs have begun to keenly consider the negative forces that impact on the environment. This awareness is not exclusively on an organization's actions such as manufacture and marketing but also on its supplier angles. Consequently, shared concerns in green procurement are supervisory compliance, customer burden, risk minimization and the monitoring of green performance process. Green Procurement is one of the emerging issues and new innovation that helps organizations develop "win-win" strategies that achieve profit and market share objectives by lowering their environmental risks and impacts, while raising their ecological efficiency (Van Hock, 2000). It involves considering social coupled with environmental factors into deliberation together with financial factors in making procurement pronouncements. Green procurement involves looking beyond the traditional economic parameters and making decisions based on the whole life cost, the associated risks, measures of success and implications on society and the environment (Nderitu & Ngugi, 2014). It is based on the belief that companies can simultaneously benefit from elements of economics, environment and society according to IBM Global Business Services (2009).

Chartered Institute of Purchasing and Supplies, CIPS (2007), on the other hand defines green procurement as a consideration to the environmental, social and economic consequences of design, materials used (renewable and non-renewable) manufacturing methods, logistics and disposal. Jerry (2000) says, utilization of green procurement has been quite limited such that a decade ago, only some high-profile organizations mainly chemical firms and/or those firms in the consumer goods sectors that have experienced green consumer pressures directly in order to practice it. Organizational Performance Management in a bid to promote progress towards goals in a business environment, it responds to crisis as they arrive, fixing broken systems,

replaces failing management and redefining un-meet able goals. This is done through techniques for monitoring progress, including the performance of systems, subsystems, departments and employees. It analyzes aggregates of performance data in order to measure progress toward defined goals. However OPM has been criticized for being able to consider the un-tangible goals and how to measure them.

Green Procurement has become very steadily one of the aspects of managerial practices that assimilate environmental matters into the issue of supply chain management (Li, 2011; Hu & Hsu, 2010). In supply chains with several sellers, producers, distributors and vendors, whether locally or globally spread, performance measurement is problematic as it is hard to accredit performance outcomes to one particular unit within the chain. Considering the challenges aforementioned, green procurement is required for a host of reasons (counting governing, marketing and competitiveness motives). Overcoming these barriers is not a trivial issue, but the long-term sustainability (environmental and otherwise) and competitiveness of organizations may rely on successful adoption of GSCM (Sharfman, Shaft & Anex, 2009)

Consumers are also beginning to question the environmental effect of the goods that they buy and expect firms to pursue a minimum green standard in their product and product designs (Tate et al, 2010). Socio - cultural responsibility - A firm may perceive a voluntary obligation to society in order to achieve harmony with social expectations, norms and codes of conduct that dictate acceptable business behaviors (Jones, 1999).

Implementing greener supply initiatives can lead to an array of benefits for the company itself, for the purchasing and supply process, and for society at large. Benefits for the buying company include cost reduction and improved efficiency, as the environmental initiatives take out waste and excess material, as well as an improved image among regulators and the general public. Greener supply can contribute to a more holistic approach to managerial decision-making. The purchasing and supply process can be improved to the extent that greener supply facilitates information sharing and co-operative relationships in the supply chain. Benefits of greener supply to society begin with environmental improvements, the reduction of hazardous materials, the more efficient use of scarce resources, and the avoidance of waste. Greener supply also aids the diffusion of environmental know-how and best practices. Environmental initiatives in the manufacturing supply chain should focus on the product and manufacturing processes used by the supplier.

The Kenya government has put in place a wide range of policies, institutional and legislative to govern all business activities to ensure there is protection of the environment (Odhiambo, 2008). These include Environmental Management and Coordination Act (EMCA) 1999 that provides for the establishment of an appropriate legal and institutional framework for the management

of the environment and related matters. All organizations within the country are obliged to comply with the Act (Martin, 2012). According to Kenya Solid Waste Management (2013), industrial wastes constitute about 23% of the total waste generated in the Nairobi city, only about 25% of the estimated 1,500 tones of solid waste generated daily get collected.

The environmental impacts of the tea industry are considerable. There is momentous loss in biodiversity when significant biodiversity areas like forests are rehabilitated to tea plantations. Wal (2008) noted that along with environment change, getting firewood to process tea, especially, has caused widespread deforestation in countries like Malawi, Kenya, India and Sri Lanka. Energy consumption for tea processing is also high. Countries like India, Vietnam and Sri Lanka have huge application of pesticides that also negatively affect the local and broader environment (Air pollution, water pollution, diminished soil biodiversity).

According to Afande (2015), some companies' green strategies include: repositioning products without changing product composition; modifying existing products to be less environmentally harmful; modifying the entire corporate culture to ensure that environmental issues are integrated into all operational aspects; and the formation of new companies that target green consumers only produce green products. Green product attributes may be environmentally sound processes, responsible product uses, or product elimination, which consumers compare with those possessed by competing conventional products. However, implementation of environmental strategies in Kenya is based very much on ad hoc practices and many of them do not actually subscribe to any particular environmental concept.

1.2 Statement of the Problem

The need to improve organizational efficiency, reduce waste, overcome supply chain risk, and achieve competitive position has made companies in Kenya to start considering environmental issues from a competitive view point. Many Tea processing companies' activities in Kenya just like many other manufacturing firms in across the world have faced environmental challenges such as hazardous waste, that is, waste disposal of the products by the consumers; need to reduce carbon dioxide emissions. To enhance environmental conservation, tea processing firms have adopted green initiatives such as green supplier selection, green manufacturing, reverse logistics and green distribution. However, in spite of the efforts, many environmentalists have complained about the sustainable utilization of natural resources and diminishing land fertility, deforestation and all pollution (Amemba et al, 2013).

This will be a further inquiry according to Otieno (2012) procurement functions of most entities do not comply to set procurement practices and performance procedures, leading to irregular and subjective decisions that have had costly consequences for many entities, and the country at

large. It is in the interest of the study that financial performance should not be the only measure to conclude the performance of the procurement function thus intangible performances like quality of procured goods and services, timely delivery of orders, customer satisfaction, dependability, flexibility and quality of employees should all be included (Atkinson, 2006) hence the need for the study. In spite of having various studies undertaken on procurement strategies by various researchers, none of the studies have particularly addressed the effect of green procurement strategies on performance of tea processing factories in Kisii County. It's against this background that this study sought to investigate the effects of Green procurement practices on performance of selected tea processing factories in Kisii County, Kenya.

1.3 Research Objectives

The general objective was to investigate the effects of Green procurement practices on performance of selected tea processing factories in Kisii County, Kenya.

The study was guided by the following specific objectives:

- To establish the effect of green supplier selection on performance selected tea processing factories in Kisii County, Kenya
- To determine the effect of green manufacturing on performance of selected tea processing factories in Kisii County, Kenya
- To examine the effect of reverse logistics on performance of selected tea processing factories in Kisii County, Kenya
- To evaluate the effect of green distribution on performance of selected tea processing factories in Kisii County, Kenya

II. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Institutional Theory

Institutional theory provides that companies undertake certain strategies based on forces outside the company (Scott, 1994). These strategies help companies to enhance their acceptance by the customers and other stakeholders. Aspects of isomorphic pressures have been recognized namely coercive, normative and mimetic pressures, which lead to the implementation of similar practices across firms (DiMaggio and Powell, 1983). Jennings and Zandbergen (1995) gave an explanation on the adoption of practices within the environmental

context, including other scholars who have further explored the positive impact of these institutional pressures on green procurement (Sarkis *et al.*, 2010).

2.1.2 Resource Based View Theory

The RBV theory of the firm emphasizes that valuable, rare, imperfectly imitable, and non-substitutable resources create a competitive edge (Melville, Kraemer and Gurbaxani, 2004). Cardeal and Antonio (2012) explained that the resource based view (RBV) considers certain resources and notes that a competitive edge is founded on Valuable, Rare, Inimitable resources and Organization (VRIO). These resources include assets, capabilities, organizational processes, information, grouped as tangible or intangible resources. The RBV highlights that the environment may create a barrier that affects the competitive business edge and hence the need for businesses to leverage on the environmental advantages in order to be ahead of competition (Hart, 1995). Prahalad and Hamel (1994) promoted the theory of core competences. Competences represents what a company is able to excel (Prahalad and Hamel, 1994), however, the core competencies represents a set of abilities that a company can leverage to outperform peers in the market place (Lawson and Lorenz, 1999). Under the Resource Based View, it is important that companies channel resources to leverage their core competences. This theory is key to companies listed at the NSE implementing green procurement practices.

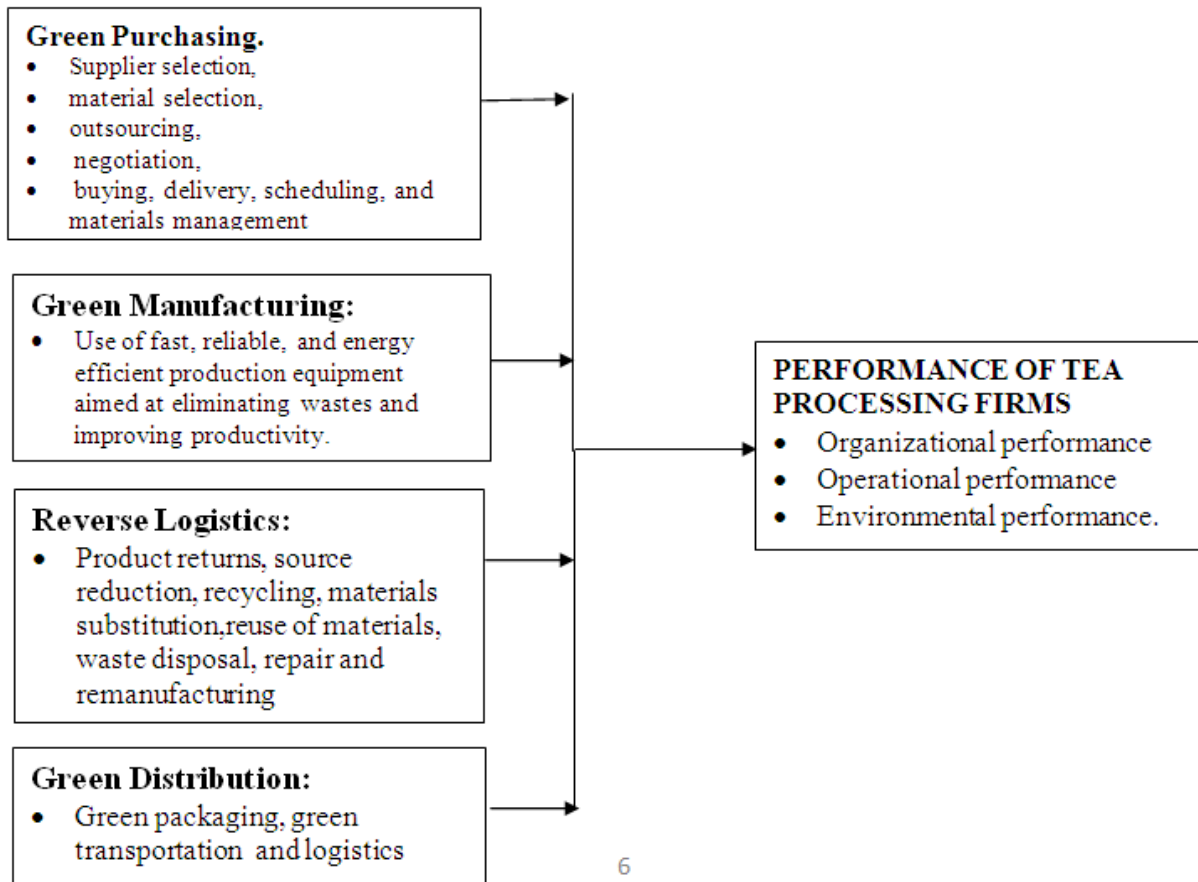
2.1.3 Stakeholder Theory

The definitions of the term “stakeholder” have been given by different researchers (Mainardes, Alves and Raposo, 2011). However, most studies adopt the definition by Freeman (1984) who described stakeholder as individual or group impacted by commercial activities of a company. Stakeholder theory notes that other than shareholders, there are other individuals or groups who the organization is obligated to and who are likely to be directly influenced by the actions taken by it, or have an explicit contractual relationship with it (Alkhafaji, 1989). With respect to the environment, some stakeholders expect that firms will operate in ways that minimize externalities such as water pollution, solid waste disposal, forest cover depletion and emission of environmentally harmful gases and assume greater responsibility to correct any effects that may occur (Alkhafaji, 1989). Failure by the organization to meet these expectations results in loss of legitimacy and subsequently diminishes its chances of survival. From a strategic point, firms that adopt GP practices have an edge over competition.

2.2 Conceptual Framework

Independent Variables

Dependent Variable



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2.3 Empirical Literature Review

A study done by Agarwal and Vijayvargy (2012), on supplier assessment in environmentally responsive supply chains through analytical network process found that Supplier assessment is also necessary for sustainable supply chain analysis based on the analytical network process (ANP) and environmental factors. Since environment protection has been concern to public in recent years, and the traditional supplier selection did not consider about this factor; therefore, this paper found introduces green criteria into the framework of supplier selection criteria, hence this criteria is very important for organizational performance. Liao and Rittscher (2007),

on green suppliers with environmental performance in the supply chain perspective he found out that GSCM lead to material cycles in the supply chains managed in an environmentally, socially, and economically responsible manner that is, the product must generated as little waste as possible and conserve energy at each stage of the product's life cycle.

Nimawat and Namdev (2012), noted that green manufacturing comprises of quick, reliable, and energy effective manufacture equipment intended to eradicate wastes and refining productivity. Al-Odeh and Smallwood (2012) associated green manufacturing with clean production method, efficient technology, reduced raw materials and resources so as to reach low input, high output and low pollution while Amemba et al. (2013) advocated for use environmentally friendly energy sources like solar energy, recycling of raw materials and use biodegradable energy sources and materials in manufacturing operations.

Nimawat and Namdev (2012), described reverse logistics as the place of logistics in merchandise returns, source decrease, recycling, resources substitution, reuse of resources, waste disposal, reparation and remanufacturing. It is a system for the recovery of used materials and products. Organizations can employ reverse logistics via recycling and waste logistics which can be set up based on the actual need for the gathering, organization, processing, packing, handling, storing, and distribution to particular treatment facility for dispensation (Zhang and Zheng, 2010).

According to Ninlawan et al., (2010 Green packaging involves downsized packaging and use of green packaging materials. They also highlight the importance of cooperation with sellers to regulate packaging, inspire and adopt returnable packaging approaches, endorse recycling and reuse of packaging resources. The storage facility is another important aspect of green distribution. The storage facility should be capable of storing different categories of materials. Key in distribution is transportation, According to Al-Odeh and Smallwood (2012), factors like: fuel, modes of transport, infrastructure, and operational practices are important factors to consider in developing green transportation.

III. RESEARCH METHODOLOGY

3.1 Research design

The study uses descriptive research design to carry out the study because it obtains information concerning the current status of the phenomena with respect to variables in a situation. It also enables subjects to give more information on the issues of interest to the researcher (Mugenda, 2003). Specifically, the researcher uses a survey study of selected tea in Kisii County which it includes Kiamokama, Ogembo and Kenyerere tea factories.

3.2 Target Population

Target population in this study comprised of all the employees working in procurement department, a population of 96 people which is the total number of employees working in the procurement departments in the three tea firms in Kisii County.

Table 1 Target Population

| Factory | Target population |
|--------------|-------------------|
| Kiamokama | 32 |
| Ogembo | 31 |
| Kenyerere | 33 |
| Total | 96 |

3.3 Sampling Techniques and Procedures

This study used census method because the target population was less than the minimum a hundred respondents for sampling method to be adopted and therefore a sample size of 96 was considered.

Table 2 Sample Size

| Factory | Target population | Sample Size | Percentage % |
|-----------|-------------------|-------------|--------------|
| Kiamokama | 32 | 32 | 100 |
| Ogembo | 31 | 31 | 100 |
| Kenyerere | 33 | 33 | 100 |
| Total | 96 | 96 | 100 |

3.4 Research Instruments

The study employed the use of questionnaires as the principle data collection tool to collect views from the respondents. The questionnaire consisted of two sections; where the first part mainly contained demographic information while the second part focuses on the effects of

green procurement practices on the organizational performance of tea processing factories in Kisii County. Questionnaires provide high degree of data standardization and adoption of generalized information amongst any population (Chandran, 2003).

3.5 Data Presentation and Analysis

The collected data was analyzed using both qualitative and quantitative techniques to ensure triangulation. Qualitative data was analyzed using thematic data analysis taking into account common words, phrases, themes and patterns in order to enhance understanding (content analysis) in line with the study objectives. The quantitative data was subjected to descriptive statistics. The descriptive statistics involved the use of frequency counts, percentages and arithmetic means and results was presented using frequency distributed tables, line graphs, bar graphs and pie charts. All the quantitative data collected was analyzed using the Statistical Package for Social Sciences (SPSS). The model below was used in this study

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

Where

Y= Performance of tea processing firms

X₁= Green purchasing

X₂= Green manufacturing

X₃=Reverse logistic

X₄=Green distribution

β₀ β₁ β₂ β₃β₄= regression equation coefficients

e= error term of the regression equation parameters

IV. RESULTS AND DISCUSSION

4.1 Regression Analysis

The multiple regression models used are as under:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \dots \dots \dots (1)$$

Where Y is Performance of tea processing firms(dependent variable)

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α is constant

X is other factors affecting performance of tea processing firms

β is the regression coefficient which may be positively or negatively affecting dependent and independent variables.

$$EP = \alpha + \beta_1IT + \beta_2 SC + \beta_3ME + \beta_4R\&R + \varepsilon..... (2)$$

Where PTPF= performance of tea processing firms(Dependent Variable) β_1GP = Green purchasing (I.V) β_2GM =Green manufacturing (RL),= Reverse logistic, (GD)=Green distribution

Table 3 Performance of tea processing firms

ANOVA^b

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|-----|-------------|--------|-------------------|
| 1 Regression | 367.840 | 6 | 84.578 | 130.72 | .000 ^a |
| Residual | 304.560 | 285 | .647 | | |
| Total | 552.730 | 388 | | | |

Predictors, Green purchasing, Green manufacturing, Reverse logistic and Green distribution

The table above shows that The F value is 320.250 and is significant because the significance level is = .000 which is less than $P \leq 0.05$. This implies that over all regression models is statistically significant, valid and fit. The valid regression model indicates that all independent variables are explaining that there is a positive and significant relationship with dependent variable.

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Table 4 Model Summary

| Model | R | R Square | Adjusted R square | std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .966 ^a | .911 | .705 | .93264 |

Predictors: *Green purchasing, Green manufacturing, Reverse logistic and Green distribution*

From the table above, the regression coefficient „R = .966 or 94.4% relationship exist between (I.V's) and (D.V). The coefficient of determination, $R^2 = 0.911$ which show that 91.1% of variation in performance of tea processing firms is explained by Green purchasing, Green manufacturing, Reverse logistic and Green distribution.

Table 5 Table Green purchasing, Green manufacturing, Reverse logistic and Green distribution and Performance of tea processing firms

Coefficient^a

| Model | Unstandardized coefficient | | Standardized coefficient | | t | sig. |
|----------------------------|----------------------------|-----------|--------------------------|--|---------|------|
| | B | Std Error | Beta | | | |
| 1 (Predator) | -173 | .401 | | | -0.4303 | .486 |
| <i>Green purchasing</i> | .715 | .059 | .644 | | 12.118 | .000 |
| <i>Green manufacturing</i> | .273 | .049 | .266 | | 5.5714 | .000 |
| <i>Reverse logistic</i> | .248 | .048 | .433 | | 5.6666 | .001 |
| <i>Green distribution</i> | .247 | .047 | .422 | | 5.2552 | .001 |

The above table the regression coefficient for green purchasing on performance of tea processing firms (β_1) = 644 which shows that one percent increase in green purchasing increases 64.0 percent on performance of tea processing firms level if other variables are kept controlled. The T value is 12.504 which is significant at .000 because significance level is less than $P \leq .05$. It shows that the alternate hypothesis should be accepted that is: green purchasing has significant positive on performance of tea processing firms.

The study shows that the regression coefficient (β_2) = .266 or 26.2 % which indicates that one percent increase in green manufacturing brings on the average 26.2% increase in performance of tea processing firms level if other variables are kept controlled. The T value is 1.458 which is significant at .000 level which is less than the $P \leq .05$. It implies that the alternate hypothesis should be accepted that is green manufacturing has positive significant effect on performance of tea processing firms. The study revealed that the regression coefficient for reverse logistics on performance of performance of tea processing firms (β_3) = .433 or 43.1 % which means that once percent increase in reverse logistics increase 43.1% on performance of tea processing firms if other variables are kept constant. The T value is 2.086 which is significant at .001. Therefore the study accepted the alternative hypothesis that is reverse logistics has significant positive effect on performance of tea processing firms.

It was established that the regression coefficient for green distribution on performance of performance of tea processing firms (β_4) = .422 or 42.1 % which means that once percent increase in green distribution increase 42.1% on performance of tea processing firms if other variables are kept constant. The T value is 2.075 which is significant at .001. Therefore the study accepted the alternative hypothesis that is green distribution has significant positive effect on performance of tea processing firms.

4.2 Discussion of the Findings

The majority of the respondents support that green supplier selection on performance has an effect on performance of tea processing factories in Kisii County, Nderitu and Ngugi, (2014) studied effects of green procurement practices on an organization performance in manufacturing industry and concluded that Green procurement attributes contributes to performance excellence. Hussein and Shalle, (2014) researched on effects of sustainable procurement practices on organizational performance in manufacturing sector in Kenya: a case of Unilever Kenya limited and concluded that the Green procurement initiatives appear to be instrumental for improving supply chain performance, by harmonizing purchases, launching co-ordination initiatives, setting standards and building skills. Nasiche and Ngugi (2014), studied determinants of adoption of green procurement in the public sector and found out that

hat the success of green public procurement relies heavily on enhancing the internal capacity of the organization.

The majority of the respondents supported that green manufacturing has an effect on performance of selected tea processing factories, Nimawat and Namdev (2012), green manufacturing involves use of fast, reliable, and energy efficient production equipment aimed at eliminating wastes and improving productivity. It involves production processes that use inputs with minimal or reduced environmental impacts and which are highly efficient, and are associated with little or no waste or pollution (Amemba et al., 2013). Al-Odeh and Smallwood (2012) associated green manufacturing with clean production method, efficient technology, reduced raw materials and resources so as to reach low input, high output and low pollution while Amemba et al. (2013) advocated for use environmentally friendly energy sources like solar energy, recycling of raw materials and use biodegradable energy sources and materials in manufacturing operations.

The majority of the respondents support that reverse logistics has an effect on performance of tea processing factories, Olaf Schatteman (2013), reverse logistics involves the activities to avoid returns, to reduce materials in the forward system so as to reduce materials flow back and ensure reuse and recycling of materials. Muttimos (2014), conducted a study on relationship between reverse logistics practices and organizational performance of manufacturing firms in Kenya, where increased organizational performance of manufacturing firms were found to be dependent on increased adoption of remanufacture and recycling reverse logistics practices with minimal adoption of reuse reverse logistics practice. Kabergey and Richu (2015), on effect of reverse logistics on operational performance of sisal processing firms in Nakuru County, Kenya, the study revealed that product recovery and product reuse both have positive effect on operational performance of sisal processing firms.

The majority of the respondents support that of green distribution has an effect on performance of tea processing factories, Ninlawan et al., (2010) Green packaging involves downsized packaging and use of green packaging materials. They also point out the need to cooperate with vendors to standardize packaging, encourage and adopt returnable packaging methods, promote recycling and reuse of packaging materials. The storage facility is another important aspect of green distribution. The storage facility should be capable of storing different categories of materials.

V. CONCLUSION AND RECOMMENDATIONS

The study concluded that;enhanced supplier development through green supplier selection is one of the effects of green supplier selection on performance selected tea processing factories in Kisii County, on the other hand, the study found out that increased quality environment through friendly supplier selection,improved customer service through green supplier selection,improved supplier relationship through green supplier selection andimproved total cost of owning are other effects of green supplier selection on performance selected tea processing factories in Kisii County.Reduction of product impact within the supply chain is one of the effects of green manufacturing on performance of selected tea processing factories in Kisii County, similarly; the study established that the use of biodegradable materials ,use fast and reliable energy for efficient production ,high output and low pollution andrecycling raw materials and use of biodegradable sources are other effects of green manufacturing on performance of selected tea processing factories in Kisii County. Product returns is one of the effects of reverse logistics on performance of selected tea processing factories in Kisii County,on a similar case, the study revealed that, source reduction, recycling products andmaterial substitution are other effects of reverse logistics on performance of selected tea processing factories in Kisii County. Packaging is one of the effects of green distribution on performance of selected tea processing factories in Kisii County;on the other hand, the study revealed that, transportation and logistical, fast delivery anddoor delivery are other effects of green distribution on performance of selected tea processing factories in Kisii County.

Based on the research findings the study gave out the following recommendations; Tea processing factories in Kisii Countyshould use of fast, reliable, and energy efficient production equipment aimed at eliminating wastes and improving productivity to enhance green manufacturing.The study recommended that management of processing firms should look at reverse logistics as a strategy to achieve competitive advantage and manage it strategically just like other key management areas. For tea processing factories in Kisii Countyto give out quality packaging materials, their storage facility should be capable of storing different categories of materials. In addition, the design and construction of storage facilities must meet the requirements of non-polluted environment, while strengthening maintenance of good humidity, corrosion, waterproofing among other factors

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