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EFFECTS OF SUPPLIER SELECTION ON SUPPLY CHAIN PERFORMANCE OF PLASTIC MANUFACTURING FIRMS IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

Purpose: *The study aimed at determining the effects of supplier selection on supply chain performance of Plastic Manufacturing Firms in Nairobi City County*

Materials and methods. *The study adopted a descriptive research design This design was preferable for this study because it enabled the researcher to undertake a breadth of observations on phenomenon under study. Besides, it provided accurate descriptive analysis of the characteristics of the population from which the study sample was drawn to make inferences about it. The study population for this study was 400 employees of plastic Manufacturing firms at their head office in Nairobi. The study population was composed of 400 members of staff in different managerial levels currently working at ten plastic Manufacturing firms in Lunga Lunga Road Nairobi County because of their proximity, accessibility, similar production methods and more than years of operations. The study used the Krejcie and Morgan (1970) formula to arrive at the sample size. The respondents of the study were stratified in to four strata's. The study targeted a sample of 200 staff working in procurement and operations departments of plastic manufacturing firms in Nairobi. Out of the 200 distributed questionnaires, 176 were filled and returned.*

Results: *The study established that for sustainable supplier selection process and long term collaboration, each determinant of the supplier selection should be found and evaluated during selection process. Within this context, in green supplier selection area are taken into consideration and both of plastic manufacturing firms and environmental criteria are gathered in a hierarchical criteria tree for supplier selection process.*

Recommendations: *The study recommends that Supplier evaluation and selection is critical for manufacturing firms since its performance determines the quality of the procurement, and ultimately affect the firm's operations performance and market competitiveness.*

Keywords: *supply chain Performance, Product Compliance, Product Quality, Technical Quality, Green Products and Plastic Manufacturing Firms*

1.0 INTRODUCTION

1.1 Background of the Study

Green Procurement means purchasing products and services that cause minimal adverse environmental impacts. It incorporates human health and environmental concerns into the search for high quality products and services at competitive prices (Victor & John, 2009). The world population has a responsibility to develop and implement procurement policies that promote a sustainable approach to making goods and services (Nasiche & Ngugi, 2014). Increasingly, governments, enterprises and development agencies have adopted environmental criteria within their supply chain system in order to promote corporate objectives on sustainable development (Nijaki & Worrel, 2012).

Various researchers have examined the positive linkage between effect of green procurement and its contribution towards reduction of sources of waste and promotion of recycling among other benefits (Guenther, 2010). This contribution from procurement has strategically positioned environmental issues within organizations as part of the corporate wide goals. Procurement has conventionally been seen as a process where raw materials or inputs are acquired, transformed into finished outputs, and then distributed to the customer.

This should gel with the growing importance of suitability of the environment as part of the business norm. The procurement function therefore, having grown over the years, has become a strategic contributor to the corporate objectives, by continuously reducing environmental impact arising from business activities (Preuss, 2001).

Over the years there has been a repeat of events such as the energy crisis and prevailing consumerist behavior which encourages high demand especially for raw materials by individuals and organizations alike. This has led to diminishing sources of raw materials and hence the focus has been on conservation and use of recycled materials. Green procurement is a holistic approach that encompasses organization, people, processes and technology. It is also known as the sustainable procurement, and some companies realized a long time efficiency in energy usage, waste generation and water consumption along with use of recycled materials resulted in reducing costs (Victor & John, 2009).

Green procurement 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.

1.1.1 Global Perspective of Green procurement implementation

As an emerging policy with the ambitious goal of addressing the long-standing stalemate between economic growth and environmental sustainability, green growth has come a long way from a mere buzzword to a new development paradigm. In the global effort toward green growth, no country has blazed this new trail with such unparalleled passion as the Republic of Korea (ROK or Korea hereafter). The country perceives green growth as an opportunity to achieve greater levels of prosperity by changing the ways in which it pursued development in the past because the business as-usual ways have proven to be unsustainable.

The rise of green growth as a development policy has been swift since the time when the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) brought green growth to the discussion table at the Fifth Ministerial Conference on Environment and Development in Asia and the Pacific in 2005, putting forward an official declaration that adopts green growth as a strategy toward sustainable development. What explains the shift from being a sheer attractive slogan (Schmalensee, 2012) to a policy approach that even defies traditional growth models? Despite the traditionally perceived antithetical correlation of green and growth two major factors were identified to have triggered the strong endorsement of green growth in the international community.

The Marrakech Task Force on Sustainable Public Procurement (MTF or SPP) which was managed by Switzerland from 2006 to May 2011 established an approach for the effective implementation of sustainable procurement. This approach was named the MTF Approach to SPP. Since then, the United Nations Environmental Programme has worked together with the Swiss government to develop a project to implement sustainable procurement worldwide. According to Reza (2013).The project named Capacity Building for Sustainable Public Procurement in Developing countries were piloted in different countries, Chile, Colombia, Costa Rica, Lebanon, Mauritius, Tunisia, and Uruguay and since then, the list of countries adopting this newly designed approach to developing has increase adding even more advanced and industrialized nations to be used as case studies to measure the efficiency and benefits of the implementation of sustainable public procurement. Weele (2010).states that In Brazil, the project involved recycled paper, in Costa Rica, the management services was redesigned, toner cartridges for laser printers was the main objective in France, in Hong Kong and China the nations aimed to improve traffic with LED traffic lights retrofit, organic food for school children in Italy, sustainable construction in England, consultancy and temporary staff services was renovated in Scotland, and in the United States, there was a push for the sustainable transportation of waste (Reza, 2013).

1.1.2 Regional Perspective of Green procurement implementation

Eyaa and Oluka (2011) conducted a cross sectional study on the causes of noncompliance in Public Procurement in Uganda on Central Government Procuring and Disposing Entities (PDEs) which did indicate that that only familiarity with rules is a significant predictor of compliance. The implication is that the more procurement personnel are familiar with the regulations, the more compliant they was be and the study did not explore the structure of the country's procurement legal framework and how it affects the performance of Public Entities.

Osei-Tutu, Mensah and Ameyaw(2011) studied the level of compliance with the public procurement Act in Ghana targeting Public Entities in local government, education and health as representation of procurement activities of the Ashanti and Brong Ahafo regions. Four main compliance areas with sub-criteria adopted were management systems, information and communication, procurement process and contract management. The simple method of calculating averages was employed in the computations to determine the degree of compliance and obtaining a 100% would imply that the Public Entities fully complied with the requirements of the procurement law in that particular area.

Similar cases have been recorded in Africa like in Nigeria, fire broke out on pipeline Ilado, Lagos Island on May 12th 2006 resulting in more than 200 deaths (Balogun *et al,* 2006). The loss of oil through pipeline was as result of leaks and busts which occasion high frequent replacement and lifecycle expenses, including normal operational disruptions (Onyekpe & Dania, 1997). Oil transportation impinges on the environment: the ecosystem; air, water, land and the economic loss resulting from compensation.

1.1.3 Local Perspective of Green procurement implementation

A study by Kenyanya, Mamati and Onyango (2009) sought to determine the influence of the public procurement disposal act, (2006) on procurement practices in Public Entities in Kenya. Data were collected from 95 respondents of tender committee members, the suppliers and the principals of the schools. Study established that the regulations have had a significant influence on pricing of goods procured and lead time.On the other hand, the same regulations have had a less significant influence on transparency of the procurement process and quality of goods procured.

Achuora, Arasa and Onchiri (2012) conducted a study on the factors affecting effectiveness of Public Procurement audits for constituency development funds in Kenya. Specifically it sought to investigate the effect of the legal framework, auditor's specific professional qualities, technical audit factors and client-related factors on effectiveness of Public Procurement audits.

The study findings indicate that technical audit factors have greatest influence on effectiveness of Public Procurement audit, followed by regulatory framework, client related factors and auditor's professional qualities respectively. The study narrowed its research undertakings on Public Procurement audits and hence failed to demonstrate the influence of Public Procurement rules and regulations on performance of Public Entities. In an attempt to determine factors influencing compliance to procurement regulations in public secondary schools in Nyamache sub-county, Onyinkwa (2013), conducted a descriptive survey research in 15 schools with a sample size of 135 respondents. The study established that ethics, awareness and training influence compliances with procurement regulations. Study concentrated its research undertakings on procurement regulatory compliance challenges did not show the effect of compliance on performance of the schools.

Currently, there is a Public Procurement Oversight Authority (PPOA) to steer the procurement in the public sector as well as legislative changes including the enactment of the Public Procurement Act 2005. The Public Procurement and Disposal Act, 2005 created the Public Procurement Oversight Authority (PPOA), the Public Procurement Advisory Board (PPAB) and the continuance of the Public Procurement Complaints, Review and Appeals Board as the Public Procurement Administrative Review Board (PPARB). The PPAB and PPARB are autonomous bodies (PPOA, 2011). Aketch (2005) reviewed the procurement regime of Kenya's first Sector Wide Approach Aid Program (SWAp), that is, the Ministry of Justice and Constitutional Affairs' Governance, Justice, Law and Order Sector (GJLOS) Reform Program in the context of the then on-going public procurement reform efforts.

The author noted that GJLOS's procurement regime was inefficient and unlikely to be effective since it created administrative structures that were not only unwieldy but also run parallel to the national system. The Public Procurement Disposal Act (PPDA) of 2005 is however silent on green procurement. This means that there is no legislative mandate in Kenya for public or private entities to adopt green procurement measures. Any such adoptions are voluntary and driven by other factors other than legislation.

1.1.4 Plastic Manufacturing Firms in Nairobi

Plastic Manufacturers in Nairobi County are primary plastics manufacturers in Africa, providing solutions to a number of industries, NGO's, commercial enterprises, schools and hospitals, as well as designing and supplying a number of best-selling products to the domestic market (KAM, 2011).

The plastic manufacturing offer Kenyan market with innovative cutting-edge plastic packaging solutions to its customers. Their products range from Preforms, Pet jars, Bottles, Containers, Labels, Caps/Closures and much more. (KAM, 2011), This manufacturing industry has most of the professional, skilled and experienced staff

which ensure high quality products and offer inspired designs, great customer services and flexibility, and the ability to deliver on time with affordable prices (KAM, 2011)

The manufacturing firms in Kenya have been classified by various scholars and researchers based on different characteristics. Some authors classified firms based on the quality of service or production, the size of the work force, and the numbers of facilities. In Kenya, according to the KAM directory (2010/2011) large-scale manufacturing firms have more than 100 workers, medium-scale firms have from 51 to 100 workers, small-scale manufacturing firms have from 11 to 50 workers, and micro-scale firms are those with 10 or fewer workers(KAM, 2011).

The manufactured or synthetic plastics are often designed to mimic the properties of natural materials. Plastics, also called polymers, are produced by the conversion of natural products or by the synthesis from primary chemicals generally coming from oil, natural gas, or coal (KAM, 2011).

1.2 Statement of the Problem

Green procurement is a new challenge in purchasing of products. The concept of green procurement is gaining prominence in empirical literature, with scholars pointing at a possible relationship between green procurement and organizational performance. It is increasing being used as an effective way to reduce the effects of consumption on the environment and also to promote growth of clean production technology (Prospect, 1992).

Locally, green procurement has been a logical extension of this work (Brammer & Walker, 2011), Kenya Pipeline Company annual accounts report for 2011/2012 financial year show that net profit after tax increased by 81% from Kshs. 3.8 billion in 2011 to Kshs. 5.5 billion in 2012. The good performance is however marred by allegations of irregular procurement at the company, including non-adherence to environmental issues. Kenya Anti-corruption Commission report 2009/2010 show that the company was investigated for allegations of irregular procurement and award of a tender for rehabilitation of the line 1 pipeline, costing Kshs.7600M (KACC, 2011). Tones of 'dirty' super petrol found its way into its pumping system, and were at a loss to explain how 600,000 tones found its way into the pipeline (KPC, 2012). In May, 2012, the company had to halt supply after the pipeline leaked leading to fire in Mukuru- Sinai slums in Nairobi. Further, in June, 2012; KPC had to halt supply through Nakuru when the pipe line burst (KPC, 2012).

East African Breweries Limited announced its full year results, posting a growth rate volume of 3% and net sales growth of 6%. Its net capital expenditure was Kshs. 6 billion, covering new projects across the region, including efficiency and expansion projects in Kenya, increased packaging in Uganda and environmental efficiency in Tanzania. The increase in performance by the year 2013 might be attributed to many factors. Yet there is little or no empirical evidence available to evaluate the factor affecting green procurement implementation in the manufacturing sector. This study sought to examine if one of the contributors to increased performance is green procurement.

Qinghu (2005) observed that Green procurement in the developed nations such as China has become a key approach for enterprises seeking to become environmental efficient and increase performance in instances where there is increased competition, a lot of regulations and market pressure and drivers. According to Otokiti and Awodun (2003) organizations are paying more attention to their environment due to the complexity, turbulence and rapid changes and hence formulating and implementing policies and strategies that was enhance their survival and growth.

1.3 Objective of the study

1.3.1 General Objective

The general objective of the study was to establish effects of supplier selection on supply chain performance of plastic manufacturing firms in Nairobi City County.

1.3.2 Specific Objectives

i. To analyze the effect of Product Compliance on supplier selection of Plastic Manufacturing Firms in Nairobi City County

ii. To establish the effect of Product Quality on supplier selection of Plastic Manufacturing Firms in Nairobi City County

iii. To determine the effects Technical Quality on supplier selection of Plastic Manufacturing Firms in Nairobi City County

iv. To find out the effect of Green Products on supplier selection of Plastic Manufacturing Firms in Nairobi City County

2.1 Theoretical foundation and Literature

Theoretical frameworks are explanations about the phenomenon and provide the researcher with the lens to view the world. A theory is a set of statements or principles devised to explain a group of facts or phenomena especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena (Halvorson, 2012). Theories are analytical tools for understanding, explaining, and making predictions about a given subject matter (Creswell, 2013). A formal theory is syntactic in nature and is only meaningful when given a semantic component by applying it to some content, that is, facts and relationships of the actual historical world as it is unfolding (Shields & Nandhini, 2013

2.2.1 Institutional Theory

The study was based on Institutional Theory in establishing influence of Supplier selection on supply chain Performance of Plastic Manufacturing Firms in Nairobi. Institutional theory adopts a sociological perspective to explain organizational structures and behavior (scott, 2010). It draws attention to the social and cultural factors that influence organizational decision-making and in particular how rationalized activities are adopted by organizations. The institutional theory is the traditional approach that is used to examine elements of public procurement (Obanda, 2010). Scott, (2004) identifies three pillars of institutions as regulatory, normative and cultural cognitive. The regulatory pillar emphasizes the use of rules, laws and sanctions as enforcement mechanism, with expedience as basis for compliance. The normative pillar refers to norms and values with social obligation as the basis of compliance.

The cultural-cognitive pillar rests on shared understanding on common beliefs, symbols, and shared understanding. The major paper on institutional view as a way of explaining the drivers for sustainability responses, assuming for the most part that supply chain level actions are the result of external pressure of a coercive, normative or mimetic (cognitive) nature (Carbone & Moatti 2011, Shi *et al.,* 2012, Adebanjo *et al*., 2013, Hsu *et al.,* 2013, Lee *et al*., 2013). While it is clearly important to have an understanding of what drives firms to act, it seems this focus on drivers is part of the developmental part of the sub-field. Legitimacy is gained by responding to institutional pressures. Argues that institutional environment creates isomorphism (structures and practices) through coercive, normative and cognitive pressures. Thus, this theory supports the

variable of Supplier selection process by stipulating that institutions need to change the ways of doings things. A fundamental premise of institutional theory is that it explains why companies often adopt similar responses and practices.

2.3.1 Supplier selection

According to Maritime, (2015).defines that Supplier selection is a process by which the firms identify, evaluate, and select the suppliers of their required raw materials. Although this process deploys an overwhelming amount of any firm's financial resources, it would give substantial advantages if suppliers with high value are selected (Manyenze, 2013). Supplier selection and evaluation is the process of finding the suppliers being able to provide the buyer with the right quality products and/or services at the right price, at the right quantities and at the right time (Vorster, 2010).

Evaluation and selection of suppliers is a typical multiple criteria decision making (MCDM) problem involving multiple criteria that can be both qualitative and quantitative. Hence, supplier selection process requires a formal, systematic and rational selection model. There is an abundance of supplier evaluation and selection models proposed in the supply chain literature. Customers select suppliers based on the relative importance of different attributes such as quality, price, flexibility, and delivery performance Karimi,(2014) to sustain effective and reliable sources of supplies, buyers should select their suppliers carefully and evaluate them regularly. However, not all selected suppliers qualify for or need development assistance. (Piasecki, 2015)

The next important criterion in supplier evaluation referred in the studies is delivery time (Awino, 2011). There are also some researches about the effect of services provided by the suppliers in meeting the buyers' demand. This means the ability of the suppliers in satisfying the buyers' requirements in a timely manner as well as responding quickly to the demand changes while satisfying their price expectations simultaneously. Therefore, conventional criteria such as price, quality, delivery, and service can play a key role in supplier evaluation and selection. (Parmenter, 2015).

Since a qualified and reliable supplier is a key element and a good source for a buyer in reducing production and material costs, evaluation and selection of the suppliers is an important component of supply chain management and an important task for the purchasing department of a firm in particular (Chen, 2011).

2.4.1Supplier selection

According to Parmenter, (2015) studies Supplier selection relies on multiple assessment techniques which include both quantitative and qualitative methods (Gillett, 2015.). At the same time, many organisations continue to select suppliers based on experience and intuition selective and unreliable approaches Kreiger, 2013). The most common evaluation criteria used to select suppliers are: financial health, expertise, operational performance metrics, business processes and practices, enabling behaviours or cultural factors and risk factors (Aiter et al., 2011

Supplier selection, along with supplier evaluation and continuous measurement/assessments, is an important organisational process: purchased products represent between of end product sales and have a direct impact on the cost and quality of products. In addition, even a small cost gained by selecting a good supplier can have great impact on benefits (Weele, 2010).

During recent years supply chain management and the supplier (vendor) selection process has received considerable attention in the business management literature. In a study by Petroni, (2010) found supplier involvement to be an important dimension of quality management. Chen, (2011) classify the supplier selection

process as an important operation management (OM) decision area. They suggest that OM research should attempt to identify the supply chain management practices that provide a competitive advantage. (Manyega, 2015). Also identifies supply chains as multi-disciplinary in nature and recommends an integrated OM/marketing approach.

Johnston, (2014) in one of the early works on supplier selection, identified over twenty supplier attributes which manage tradeoff when choosing a supplier. Since then, a number of conceptual and empirical articles on supplier selection have appeared. Echtelt, (2008) proposed a multi-objective approach to vendor selection. Their methodology provides a useful decision support system for a purchasing manager faced with multiple vendors and issues such as price, delivery reliability, and product quality.

A study by Kiplagat and David, (2015) on Effect of Supplier Management Practices on Supply Chain Performance among State Corporations in Kenya: A Case of the Kenya Medical Supplies Authority. Findings were that proper identification practices were further regarded as very crucial in acquiring the right suppliers and therefore supplier identification needs to be performed with care to avoid errors that may have long-lasting effects on a company. In summary, most of the articles referenced above suggest that managers perceive quality to be the most important supplier attribute. The conceptual articles emphasize that managers should not select suppliers based on low cost only but should consider quality, delivery performance, and other attributes.

2.4.5 Procurement performance

Awaysheh, & Klassen, (2010). Performance management focuses on enhancing organizations systems including people to increase an organization's capacity for performance. Includes extensive use of principles of systems theory. In and of it, this is not an overall comprehensive process assured to improve performance. Its effectiveness toward reaching overall results for the organization depends on how well the enhanced ability to learn is applied in the organization (Mahmood, 2010).

According to Chahdi, (2013).provides that Performance Management (PM) is more than the end of the year appraisal. It's about translating goals into results. Performance Management focuses not only on individual employees but also on teams, programs, processes and the organization as a whole. A well-developed PM program addresses individual and organizational performance matters necessary to properly create and sustain a healthy and effective results-oriented culture. Poluha, (2016) explains that Public agencies have a greater challenge to define and measure results than private sector organizations, whose results are almost exclusively tied to financial goals. Public agencies are also required to comply with complex regulations that govern their performance management programs. Effective PM will help your organization raise individual performance, foster ongoing employee and supervisor development, and increase overall organizational effectiveness (Mamad, & Chahdi, 2013).

2.2 Conceptual Framework

A conceptual framework explains either graphically, or narratively, the main things to be studied, taking into consideration the main factors, constructs or variables, and the presumed relationships among them" (Miles & Huber man, 1994). This process discusses the conceptual framework for analyzing the Determinants of green procurement implementation in Kenya. The Figure 1.1 below illustrates the relationship between independent and dependent variables.

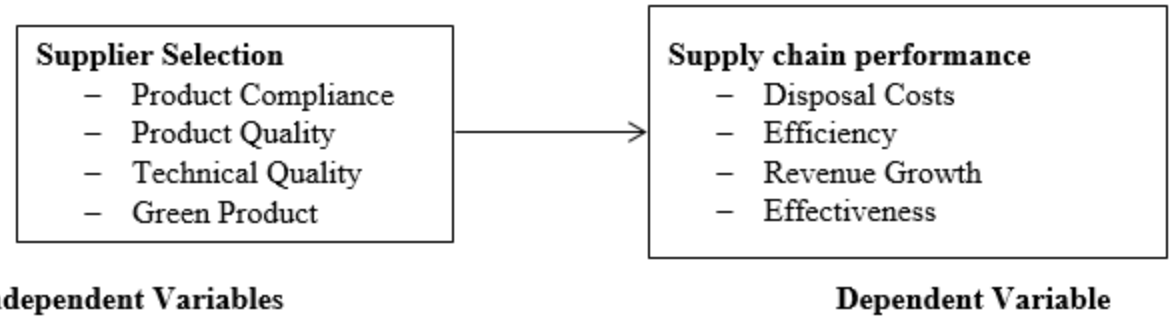


Figure 1.1. Conceptual Framework

3.0 METHODOLOGY

The study population for this study was 400 employees of plastic Manufacturing firms at their head office in Nairobi. The study population was composed of 400 members of staff in different managerial levels currently working at ten plastic Manufacturing firms in Lunga Lunga Road Nairobi County because of their proximity, accessibility, similar production methods and more than years of operations. The study used the Krejcie and Morgan (1970) formula to arrive at the sample size. The respondents of the study were stratified in to four strata's. The sample size of the study respondents was 200 respondents. The questionnaire was the selected instrument or tool for data collection for the study. The questionnaire was administered to each member of the sample population. The questionnaire was developed with reference to the research objectives aimed at answering the research questions. The questionnaire had both open and close-ended questions. The study carried out a pilot study to pretest and validate the questionnaire. Cronbach's alpha methodology, which is based on internal consistency, was used. Cronbach's alpha measures the average of measurable items and its correlation. Quantitative data collected was analysed by the use of descriptive statistics using SPSS (Version, 23) and presented through percentages, means, standard deviations and frequencies. The information was displayed by use of bar charts, graphs and pie charts and in prose-form.The regression model was used to show the relationship between the dependent variable and the independent variables.

4.0 RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

The study sought to establish Determinants of green procurement implementation on supply chain performance of plastic manufacturing firms in Nairobi City County. Specifically, the study focused on four study variables; Supplier selection Material management Waste Management System and Sustainable Supply Operations This chapter presents the empirical findings and results of the application of the variables.

4.2. Response Rate

The study targeted a sample of 200 staff working in procurement and operations departments of plastic manufacturing firms in Nairobi. Out of the 200 distributed questionnaires, 176 were filled and returned. This translated to a response rate of 88%.This response was good enough and representative of the population and conforms with Mugenda and Mugenda (2012) for generalization purposes a response rate of 50% is adequate, while that of 60% is good but a response rate of 70% as excellent. The response rate of 88% for this study was therefore excellent and acceptable. The results are based on a response rate of 88% (n=200)

Table 4.1: Response Rate

Category	N	Percentage
Responded	176	88
Did not respond and Incomplete questionnaires	24	22
TOTAL	**200**	**100**

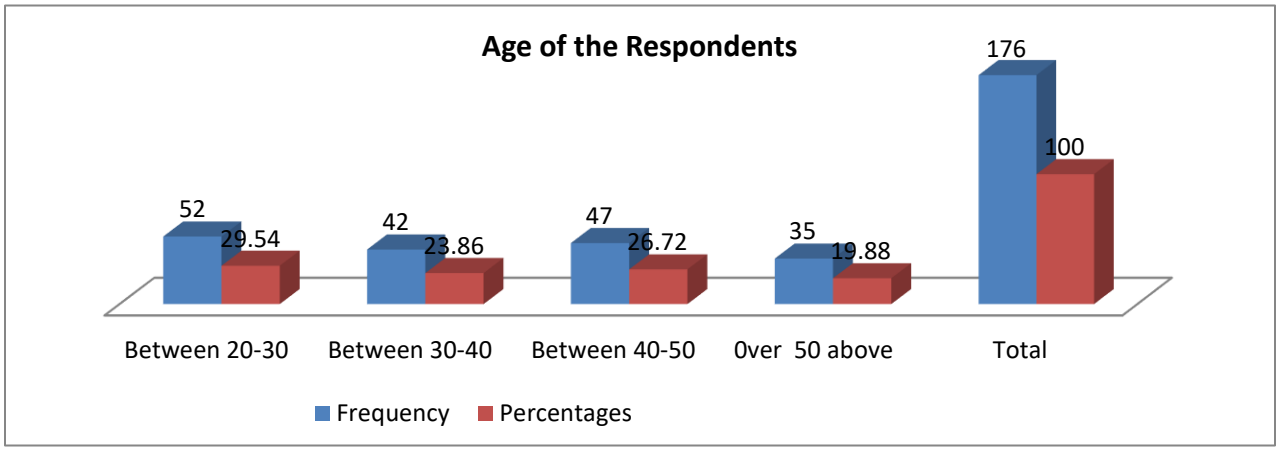
4.4 Demographic information

To obtain a better understanding of the population structure from which the sample was taken, a preliminary analysis of demographic data was carried. In this case, the researcher sought the respondents': gender, age, level of education and the duration of work in plastic manufacturing firms in Nairobi City County Demographic information provides data regarding research participants and is necessary for the determination of whether the individuals in a particular study are a representative sample of the target population for generalization purposes.

4.2.1 Age of the Respondents

From the findings in Figure 4.1, the respondents were requested to indicate on their age bracket. Majority (53.6%) of the respondents were aged between 20-40 years, 26.72% of the respondents were aged between 40-50 years and 35% of the respondents were over 50 years This implies that plastic manufacturing firms in Nairobi City County employees people who are of age this was in agreement with Chivaka, (2005). The demographic profile of the respondents is an important aspect of consumer research as the nuances of consumer behaviour can vary with changes in the demographic variables.

Table 4.2 Age of the Respondents



4.2.2 Sex of the Respondents

The respondents were requested to indicate their gender. From the findings in Figure 4.2, majority 56% were male while 44% were female. This implied that there were more male than female respondents involved in the study. The findings demonstrated that male respondents were the dominant employees in plastic manufacturing firms.this was in line Reza, (2013), that Demographic variables on age form an integral part of consumer segmentation that provides consumer insights after geographic population on sex.

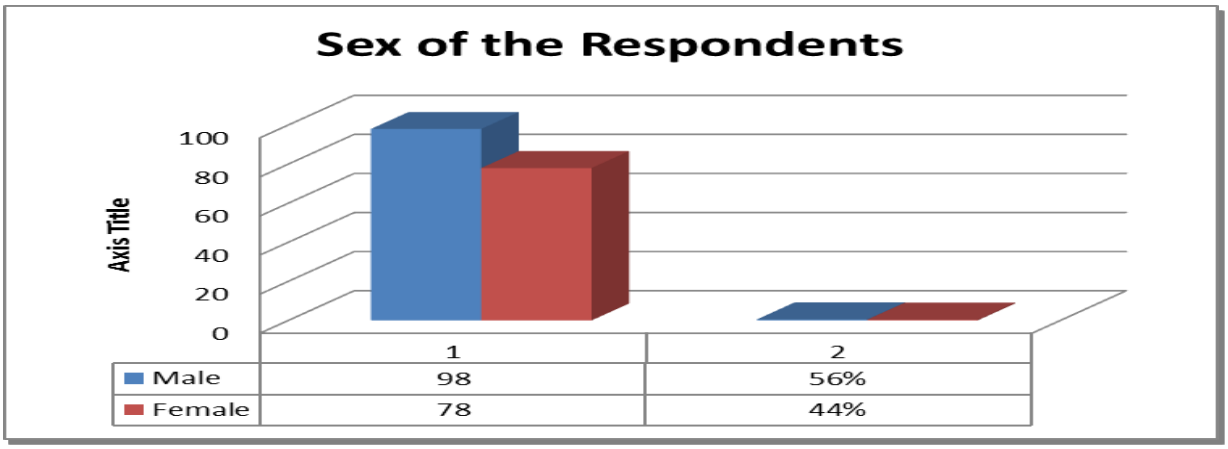


Figure 4.2 Sex of the Respondents

4.4.3 Respondents Level of education

As tabulated in table 4.3. As shown majority of the respondent had attained diploma level education with 55.11%, followed by certificate education at 27.84% while only 17.04% had attained university degree level of education The findings demonstrated that certificate diploma collage Graduated were employed in plastic manufacturing firms for their skills the finding concurs with Panagiotis, (2014), Education is likely to influence the awareness of different categories of lifestyle products and services that exist in the global and local markets.

Table 4.1: Level of education

Education level	Frequency	Percent
Certificate	49	27.84%
Diploma Collage	97	55.11%
University	30	17.04%
Total	**176**	**100.0**

4.2.5 Respondent's Years of Service

Respondents were requested to indicate the number of years they have been in service at the

Plastic manufacturing companies they work in. From the findings as indicated in Table 4.4, majority of the respondents indicated that they had been in service at the manufacturing companies for over 9 years, 6-8 years, 3-5 years and 0-2 years as indicated by as indicated by 30.68%, 29.54%, 26.70% and 13.06% of the respondents. This clearly indicated that the information on green procurement implementation on supply chainwas collected from respondents who had been in the plastic manufacturing firms for a long period of time and had experience on the Determinants of green procurement implementation on supply chain performance of plastic manufacturing firms in Nairobi City County.

Table 4.2: Respondent's years of service

Years Of Service	Frequency	Percentages
9-Above	54	30.68

6-8 Years	52	29.54
3-5years	47	26.70
0-2years	23	13.06
Total	**176**	**100**

4.4.4 Plastic Manufacturing Company

As summed up in the table 4.5 below, the study further obtained the Plastic Manufacturing Company they work for of the respondents picked from a sample of staff members involved in management of operations. The respondents were requested to indicate the Plastic Manufacturing Company they work in from the findings in Table 4.5 which showed that the percentage of staff working in all the plastic manufacturing companies was relatively equal, with a percentage of 17.04%. representing A Plus PVC Technology Co Ltd,18.75%, Adix Plastics Ltd ,Afro Plastics (Kenya) Ltd 21.02% Crown Industries Ltd 18.18% and Crown Industries Ltd 25.00%This implied that data was collected from Plastic Manufacturing Company which are majority large scale manufacturers in Nairobi.

Table 4.3: Plastic Manufacturing Company

Designation	Frequency	Percent
A Plus PVC Technology Co Ltd	30	17.04
Adix Plastics Ltd	33	18.75
Afro Plastics (Kenya) Ltd	37	21.02
Crown Industries Ltd	32	18.18
Ken Plastics Ltd	44	25.00
Total	176	100.0

4.5 Descriptive Analysis

4.5.1 Supplier selection

i. Product Compliance

The study sought the respondent's level of agreement with the following statements that relate to the Influence of Supplier selection on performance of plastic manufacturing firms and results presented on Table 4.6. From the findings, majority of the respondents strongly agreed that Conveniently assesses suppliers' compliance with the company's unique criteria on procurement initiatives with a mean score of 4.62 and standard deviation 0.81,majority of the respondents agreed that Streamlines the communications from the initial request for assessment to follow-up reminders and results sharing on set requirements in procurement with mean score of 4.16 and standard deviation of 0.97.the respondents strongly agreed that fully assessing the quality specifications as well as facilitate compliance with certifications required by the organisation with mean of 4.44 and standard deviation of 0.95.the findings agree with Awino (2011) ,that As organizations decision making in selecting the suppliers will become more critical the common criteria such as cost and quality, important role in sourcing, and try to suggest critical environmental variables which can be used in supplier selection.

Table 4.4: Product Compliance

Statements	Min	Max	Mean	S D
Conveniently assesses suppliers' compliance with your company's unique criteria on procurement initiatives	1.00	4.00	4.62	0.81
Streamlines your communications from the initial request for assessment to follow-up reminders and results sharing on set requirements	2.00	5.00	4.16	0.97
Fully assess the quality specifications as well as facilitate compliance with certifications required by the organisation	3.00	5.00	4.44	0.95

ii. Product Quality

The study sought on the extent to which respondents agreed on the given statements that relate to the influence of Product Quality on performance of plastic manufacturing firms and results presented on Table 4.7 From the findings, majority of the respondents strongly agreed that the need to use optimum machining parameters to improve machining quality is of greater importance to the firm with respondents rate of 56.25%,with 35.23% of the respondents agreeing , 2.84% of respondents neutral and only 3.41% disagreed to statement. Contribution on Present applications of life cycle assessment (LCA) as an instrument for the support of decision-making was highly recommended with 76.14% of the respondents strongly agreeing , 17.05% of the respondents agreeing while only 1.14% of the respondents disagreed . Attention been given to original expectations, present drawbacks and future perspectives on quality approach was highly rated by respondents with 48.30% strongly agreeing and 42.05% of the respondents agreeing .The finding agreed with Singer, (2017). Who stated that process planning activity for manufacturing products with high quality and low cost? The machining economics model usually contains a highly production process on quality management

Table 4.5: Product Quality

Statements	1	2	3	4	5
Present applications of life cycle assessment (LCA) as an instrument for the support of decision-making	1.14%	2.84%	2.84%	17.05%	76.14%
Attention is given to original expectations, present drawbacks and future perspectives on quality approach	3.98%	1.70%	3.98%	42.05%	48.30%
The need to use optimum machining parameters to improve machining quality is of greater importance	3.41%	2.27%	2.84%	35.23%	56.25%

iii. Technical specifications

The study sought the respondents response on the level at which they agreed with the given statements that relate to the influence of Technical specifications on supply chain performance of plastic manufacturing firms and results presented on Table 4.8. A likert scale of 1-5 was used where strongly agree=5, agree=4, not sure=3, disagree=2, and strongly disagree=1. From the finding, majority of the respondents indicated that adequate documentation to assess the respective capacity, quality, compatibility and inter-connectivity of the product offered must be included with the offer by supplier with a rate of 49.43% strongly agreeing , 43.75%of respondents agreed only 1.14 % of the respondents strongly disagreed .At a rate 38.64%of the respondents

agreed that The specifications given in the requirements based on the respective item's projected function or purpose of the item with 51.14%of respondents agreeing and only 7.95% been neutral on the statement. Respondents strongly agreed that Characteristics and features deviating from particular technical solutions, figures or values given in the specifications are rejected at a rate 38.64% strongly agreed with 51.14% of the respondents agreeing, while 1.70% of the respondents been neutral and only 0.57% disagreed. The respondents strongly agreeing that the organization should consider Green production as a business strategy that focuses on profitability through environmentally friendly operating processesThis finding is in line with that of Waithaka *et al.* (2012) that environmental technical specifications enable you organisation to ensure greater safety establish environmental protection measures Safeguard materials handling, Manage maintenance and quality assurance

Table 4. 6: Technical specifications

Statements	1	2	3	4	5
The technical specifications given in the following are requirements based on the respective item's projected function or purpose.	3.98%	9.66%	1.70%	48.86%	35.80%
Characteristics and features deviating from particular technical solutions, figures or values given in the specifications are rejected	0.57%	7.95%	1.70%	51.14%	38.64%
Adequate documentation to assess the respective capacity, quality, compatibility and inter-connectivity of the product offered must be included with the offer	1.14%	2.27%	3.41%	43.75%	49.43%

iv. Green Product

The respondents were required to indicate the extent of the influence of Green Product on the implementation of green procurement on performance of the plastic manufacturing firm in Table 4.9 respondents agreed that developing of the Green factories and products with simultaneously integrated product and process designs contributed to the implementation with a mean score of 4.51 and standard deviation of 0.97.the respondents strongly agreed that Sustainable green product design and manufacturing ,assembly systems engineering principles and rules contributed to the implementation with a mean of 4.56 and standard deviation of 0.86.the respondents strongly agreed that Create new eco-friendly products with sustainable opportunities for satisfying rapidly changing market influence implementation with a mean score of 4.56 and standard deviation of 0.86This finding is in agreement to that of Manal, & Samia. (2014) that including all aspects of energy management in every process step throughout the system's lifecycle, renewable energy creation and storage, all sorts of waste reduction methods

Table 4.7: Green Product

Statements	Min	Max	Mean	S D
Sustainable green product design and manufacturing / assembly systems engineering principles and rules	2.00	5.00	4.55	0.69
Green factories and products with simultaneously integrated product and process designs	2.00	5.00	4.51	0.97

Create new eco-friendly products sustainable opportunities for satisfying rapidly changing market needs.	2.00	5.00	4.56	0.86

4.5.5 Supply Chain Performance

Reduces Disposal Costs

The table 4.12 shows the level to which the respondents agreed with the given statements that relate to the influence of Reduces Disposal Costs on the implementation green procurement practices of the plastic manufacturing firm in Nairobi From the findings, the majority of the respondents strongly agreed Using waste as fuel can offer important environmental benefits n provide a safe and cost-effective option for wastes that would normally have to be dealt with through disposal with a mane score of 4.23 and standard deviation of 1.04 .the respondents stated that For waste reduction and cost savings in your organization, conduct a waste assessment and identifying strategic cost management with majority of the respondents agreeing with a mean score of 4.28 and standard deviation 0.87.the finding identified that the respondents strongly agreed that Waste assessment involving examining what wastes are generated and how they are managed throughout your facility for recycling and reusing with a mean score of 4.27 and standard deviation 0.92 This is in line with Baechler, (2013). Who stated that going green Most of the time it actually saves money, especially when the new products use less energy, generate less waste, and last longer the Green Products works better than their toxic counterparts Going green can reduce the costs of material management and costs operational costs.

Table 4.8: **Reduces Disposal Costs**

Statements	Min	Max	Mean	S D
Using waste as fuel can offer important environmental benefits n provide a safe and cost-effective option for wastes that would normally have to be dealt with through disposal	1.00	5.00	4.23	1.04
For waste reduction and cost savings in your organization, conduct a waste assessment and identifying strategic cost management	1.00	5.00	4.28	0.87
Waste assessment involving examining what wastes are generated and how they are managed throughout your facility for recycling and reusing.	1.00	4.00	4.27	0.92

Revenue Growth

The respondents were required to indicate to which Revenue Growth I s affected by the green procurement implementation in plastic manufacturing firms in Nairobi county .A scale of 1 to 5 where; 1= SD - Strongly Disagree 2=D - Disagree, 3=N - Neutral, 4=A - Agree and 5= SA - Strongly Agree. Mean and standard deviation were calculated for ease of comparison and generalization of findings. The finding is shown in Table 4.13 the respondents strongly agreed that the process of establishing a Green Production in manufacturing enables cost savings associated with pollution prevention efforts at a rate of 59.09%, with 30.11% of the respondents agreeing, while 2.84% of the respondents were neutral with only 0.57% of the respondents disagreeing. respondents positively rated Coupled with marketplace benefits in the realms of reputation and consumer loyalty, can make the shift a beneficial one not only for the environment, but also for the company itself with a percentage score of 33.52% strongly agreeing and 60.23% of the respondents agreeing with only

1.70% of the respondents been neutral on the statement .respondents strongly agreed that Developing waste conversion technologies reduce disposal costs, increase revenues with a rate of 39.20% strongly agreeing , 33.52% of the agreeing while only 3.98% of the respondents disagreed. This finding is in line with that of Weele, (2010). that better brand with happy customers who keep coming back and drive up sales while costs keep falling results in significant ROI and EPS, and this makes investors as re invest on the capital and shares of the organisation.

Table 4.93: Revenue Growth

Statements	1	2	3	4	5
The process of establishing a Green Production in manufacturing enables cost savings associated with pollution prevention efforts,	0.57%	7.39%	2.84%	30.11%	59.09%
Coupled with marketplace benefits in the realms of reputation and consumer loyalty, can make the shift a beneficial one not only for the environment, but also for the company itself.	3.41%	1.70%	1.14%	33.52%	60.23%
Developing waste conversion technologies reduce disposal costs, increase revenues	3.98%	5.68%	1.14%	50.00%	39.20%

4. 6 Inferential Analysis

4.5 1 Regression Analysis model

The study conducted regression analysis to establish effects of supplier selection on supply chain performance of plastic manufacturing firms in Nairobi City County the study results are shown in the subsequent sections. In table 4.24 below, the R Square, which is the coefficient of determination, was used to measure the independent variables variations and their effect on the dependent variable. As observed, The R Square value is 0.781, 0.781; this value is between 0 and 1. Analytically, this shows that 78.1% of variations in the dependent variable that can be explained by the independent variables hence 78.1% of the variation in Supplier selection in plastic manufacturing firms supply chain performance is explained by Product Compliance, Product Quality, Technical Quality and Green Products while the remaining 21.9 % is associated with factors that are not within the scope of this study.

Table 4.10: Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimate	Sig. F Change
1	.884a	.781	.776	.363	.000

a. Predictors: (Constant), Product Compliance, Product Quality, Technical Quality, Green Products
b. Dependent Variable: : supply chain performance

4.5. 2 Beta coefficients

From the regression findings, the regression equation becomes:

Y = 2.216+0.108X1+0.168 X2 + 0.055X3 +0.233 X4+e

From the regression results in Table 4.26, 2.216 represent the constant which predicted the value of supply chain performance of plastic manufacturing firms in Nairobi City County. An implication that when everything else is held constant, an indication that when green procurement implementation practices effects remain constant at zero (0 supply chain performance of plastic manufacturing firms in Nairobi City County will remain at 2.216.

Regression results revealed that Product Compliance, has significant influence on supply chain performance of plastic manufacturing firms in Nairobi City County by β_1=0.108, p=0.000<0.05, t= 1.290 the implication is that a unit increase in Product Compliance, leads to an increase in on supply chain performance of plastic manufacturing firms in Nairobi City County as indicated by β_1=0.108.

Regression results revealed that Product Quality, has significant influence on supply chain performance of plastic manufacturing firms in Nairobi City County by β2=0.168, p=0.001<0.05, t= 1.873the implication is that a unit increase in Product Quality, leads to an increase in on supply chain performance of plastic manufacturing firms in Nairobi City County as indicated by β2=0.168

Regression results revealed that Technical Quality has significant influence on supply chain performance of plastic manufacturing firms in Nairobi City County by β_3=0.055, p=0.000<0.05, t= 2.366 the implication is that a unit increase in Technical Quality leads to an increase in on supply chain performance of plastic manufacturing firms in Nairobi City County as indicated by β_3=0.055

Regression results revealed that Green Products has significant influence on supply chain performance of plastic manufacturing firms in Nairobi City County by β_4=0.233, p=0.001<0.05, t= 3.290the implication is that a unit increase in Green Productss leads to an increase in on supply chain performance of plastic manufacturing firms in Nairobi City County as indicated by β_4=0.233

Table 4.12 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.216	.109		20.389	.000
	ProductCompliance	.108	.083	.170	1.290	.000
	ProductQuality	.168	.056	.301	2.978	.001
	TechnicalQuality	.055	.063	.077	1.873	.002
	GreenProduct	.233	.071	.370	3.290	.001

a. Predictors: (Constant), Product Compliance, Product Quality, Technical Quality, Green Products
b. Dependent Variable: supply chain performance

$Y = 2.216+0.108X_1+0.168\ X_2 + 0.055X_3 +0.233\ X_4+e$

Where:

Y= performance

β0=Constant of Regression

X_1= Product Compliance

X_2= Product Quality

X_3 = Technical Quality

X_4 = Green Products

ε = Error of Regression

5.0 SUMMARY OF RESULTS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter describes the summary of the study, conclusions and recommendations of the study. The main purpose of the study was to Determinants of green procurement implementation on supply chain performance of plastic manufacturing firms in Nairobi City County.

55.2.1 Supplier selection

The study established that for sustainable supplier selection process and long term collaboration, each determinant of the supplier selection should be found and evaluated during selection process. Within this context, in green supplier selection area are taken into consideration and both of plastic manufacturing firms and environmental criteria are gathered in a hierarchical criteria tree for supplier selection process. Selection of the best supplier for every organization, identified in all the three sectors, covering manufacturing businesses. To establish a common base in order to explore both the traditional and green supplier selection criteria taken together in all the of plastic manufacturing firms in Nairobi City County in the sectors covered and To develop a mixed methodology for evaluating the criterion selection adopted in these sectors for their relative comparison and assessment a frame work is initially designed to determine the traditional and green supplier selection

5.3 Conclusion

The study concludes that Supplier selection has a critical effect on the competitiveness of the entire supply chain network. Research results indicate that the supplier selection process appears to be the most significant variable in deciding the success of the supply chain. Additionally, selection of suppliers is one of the most important aspects that firms must incorporate into their strategic processes. As organizations become more and more dependent on suppliers, the direct and indirect consequences of poor decision making in selecting the suppliers will become more critical.

5.4 Recommendations

The study recommends that Supplier evaluation and selection is critical for manufacturing firms since its performance determines the quality of the procurement, and ultimately affect the firm's operations performance and market competitiveness. Supplier selection and management could be used to increase the competitiveness of the entire supply chain. Recently, due to the governmental legislation and an increased awareness of environmental responsibility, global apparel manufacturing firms have begun to consider environmental issues in their supply chain operations. Thus, plastic manufacturing firms in Nairobi City County.

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