ASSOCIATION BETWEEN REVERSE LOGISTICS AND PERFORMANCE OF GENERAL PLASTICS LIMITED IN KENYA

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ABSTRACT

Reverse logistics is imperative for this industry for Plastics are not easy to decompose. Arguments and studies done in the field of reverse logistics and its association with organizational performance on the subject of reverse logistics focused more on the developed countries and those done in Kenya looked at other aspects of performance like supply chain performance, organizational effectiveness, ignoring the organizational performance in plastic industry. Such studies are however deficient and fail to address comprehensively how reverse logistics specifically reuse, remanufacturing and recycling directly impact on performance of the General Plastic industry. The purpose of this study was to examine the association between reverse logistics and organizational performance. The study sought to establish the association between remanufacturing and organizational performance, to examine the association between recycling and organizational performance and to determine association between reuse and organizational performance at General Plastics Limited. The study was guided by a conceptual framework with independent variable as reverse logistics and dependent variable as organizational performance. The target population for the study was 900 and sample size of 269 employees. Stratified random sampling was used to draw respondents in the sample. Descriptive statistics and correlation models were used to analyse data. The study revealed a positive and significant association between remanufacturing and organizations performance with the highest significant association existing between training of employees with a correlation coefficient of (r=.755, P=.002<.05). The study further revealed a positive and significant association between recycling and performance with the highest association existing between ensuring used goods and packages are returned to the suppliers and performance with a correlation coefficient of (r=.770, P=0.001<.05). The study moreover revealed a positive and significant association between reuse and organizations performance with the highest significant association existing between designing products that can be put into reuse and performance with a correlation coefficient of (r=.942, P=0.002<.05). The study therefore concluded that reverse logistics practises all have positive and significant association with performance although at differing extents. The study recommends that the firm should train its employees more on reverse logistics practices, ensure used goods and packages are returned to the supplier and design product that can be put into reuse after their first use to improve its performance.

CHAPTER ONE

INTRODUCTION

This section provides an overview of the background of the study, statement of the problem, objectives of the study, research questions, scope of the study, justification of the study and the conceptual framework. It introduces the main concept; association between reverse logistics and performance in General Plastics Limited. It also highlights the context of the study which is General Plastic Limited.

1.1 Background of the Study

Reverse logistics can be viewed holistically to include the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods, and related information from the point of consumption to the point of origin for the purpose of recapturing or creating value or proper disposal. More precisely, reverse logistics is the process of moving goods from their typical final destination for the purpose of capturing value, or proper disposal (Rogers and Tibben-Lembke, 2001). Becoming proficient at handling returned goods not only improves associations along the supply chain, the reduced costs improve profits and higher recovery rates are reached as efficiency and effectiveness is ensured. Reverse logistics is increasingly becoming an area of organizational competitive advantage, making the pursuit of this function a strategic decision (Stock *et al.*, 2002).

The disposal of products is no longer a responsibility undertaken solely by an organization's consumers. This is mainly due to a number of legislative, environmental, and economic reasons. Stringent packaging and environmental regulations are driving companies to be more accountable for residual products and also the final products, even after product sale. When firms investigate the re-manufacturability, reusability, and recyclability of their products then there will be fewer disposals. Fewer disposed products can benefit companies and the environment (Rogers & Tibben-Lembke, 2001). Conceptually, reverse logistics can promote alternate uses of resources that can be cost effective and ecologically friendly by extending products' normal life cycles (Melbin, 1995).

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Several organizational theories including stakeholder theory, resource based view and institutional theory have been used to understand how organizations adopt, assimilate and develop operations strategy initiatives such as total quality management, lean manufacturing, six sigma and SCM/GSCM (Laosirihongthong, Adebanjo & Tan, 2013).The stakeholder theory argues that the organization has associations with many constituent groups and that it can engender and maintain the support of these groups by considering and balancing their relevant interests (Clarkson, 1998; Freeman & Evan, 1991). Pressures from government agencies and national and international regulators will influence the adoption of environmentally responsible behaviour (Delmas & Toffel, 2004). In this regard, organizations have institutionalized environmental practices because of internal and external pressures as well as consequences of non-compliance with environmental imperatives (Narasimhan & Carter, 1998). The resource based view theory contends that the unique resources and capabilities of firms are the key sources of sustained competitive advantage (Lynch, Keller & Ozment, 2000).

In a descriptive survey research conducted by Azevedo *et al.* (2011) to identify the influence of remanufacturing on the performance of electronic industry; it was found that remanufacturing was both effective and efficient because little resources were used to produce optimal quality. Even though remanufacturing contributed to organization performance in this study, it fails to show which variables were measured such as setting up repair workshop. The study also used descriptive survey design which concentrated on a number of electronic establishments and therefore in-depth analysis is lacking when compared to case studies.

Rao and Holt (2005) examined the influence of recycling on performance of the logistics function. They established that recycling improved organization profitability. De Giovanni and Vinzi (2012) established that the existing association was not significant while Azevedo *et al.* (2011) found a combination of positive association and negative associations. The first study linked recycling to organization profitability yet profitability is not the only measure for organizational performance. It therefore failed to show the association between recycling and organizational efficiency and effectiveness. The other studies are inconsistent and also fail to link directly the variables of recycling and organizational performance.

Carter & Narasimhan (2000) conducted a study a descriptive survey to establish how reuse of glass bottles contributed to the success of the companies sampled. The study established that

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organizations were more efficient and effective because the products were mostly designed for reuse. Even though reuse of glass bottles contributed to efficiency and effectiveness of the organizations sampled, it only focused on glass bottles leaving out the plastics yet the dynamics between the two are enormous. More than that, the study used descriptive survey design and so it concentrated on a number of organizations, as such in-depth analysis of the study was limited compared to case study design.

A lot of studies have been conducted to address reverse logistics phenomenon. Holt (2005) concur that even in South Africa studies have been conducted to look at various aspects of reverse logistics including its competitive advantage, green supply chain, employment creation among other positive and negative aspects. No empirical study has been conducted to examine the association between reverse logistics and organizational performance with a focus on remanufacturing, recycling and reuse.

1.1.1 Manufacturing Sector in Kenya

The manufacturing sector plays a key role in Kenya's economic growth. The main goal of this sector is to increasingly contribute to Kenya's GDP by at least 10% per annum (KIPPRA, 2013). Additionally the manufacturing sector was expected to record a 10% growth in the 2008-2012 medium term period driven. This was largely driven by local markets, regional as well as global markets. The performance of the manufacturing sector in Kenya has not been without challenges.

The growth and graduation of the firms in the manufacturing sector has not been realized to its fullest potential due to various factors such as high cost of credit due to the high cost of raw materials, restrictive legislation in relation to environmental regulation in accordance with effluence emission or disposal and inability for industries to meet ISO 14001environmental certification and ISO 9001 product quality standards limits their product qualities and efficiencies. This makes consumers distrust these organizations and their products and/or services (Zhu & Sarkis, 2004).

According to the KIPPRA report (2013), manufacturing sector makes an important contribution to the Kenyan economy and currently employs 277,900 people, which represents 13% of labour force in the formal sector with an additional 1.6 million people employed in the informal side of the industry. Nearly 50% of manufacturing firms in Kenya employs 50 or more workers.

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The sector comprises of about 3,700 manufacturing units and is divided into several broad sub-sectors. KAM has classified manufacturing sector into categories identified as: Building, Construction & Mining, Chemical & Allied, Electrical & Electronics, Food Beverages & Tobacco, Leather & Footwear, Metal & Allied, Motor Vehicle & Accessories, Paper & Board, Pharmaceutical & Medical Equipment, Plastics & Rubber, Textiles & Apparels, Timber, Wood Products & Furniture, Consultancy & Industrial Services and SME Focal Point (KAM, 2014).

The manufacturing sector has faced various challenges when it comes to environmental concerns. Manufacturing industries are currently facing the challenge of complying with many regulatory requirements from various regulatory institutions (KAM, 2014). The consequences of non-compliance with the set environmental requirements can be expensive and time consuming. (Zhu, Sarkis, & Geng, 2005).

Manufacturing firms contribute to the environmental pollution in various ways: they generate air and/or water emissions, which include particle or chemical-filled smoke, ash and particles and chemicals that seep into ground water through run-off; use raw materials that are natural, such as wood. Laws and good environmental citizenship require that the business take measures to replace what it uses; the manufacturing process manufactures waste. Environmental laws and good environmental citizenship prohibit the indiscriminate dumping of manufacturing by product, so manufacturers must decide how best to dispense their waste. (Zhu *et al.* 2005)

As a consequence of both fast depletion of the raw materials and an increasing amount of different forms of waste (solid waste, air and water pollution), two commonly accepted primary objectives have been gaining momentum: create environmentally friendly products, (green products); and develop techniques for product recovery and waste management through reverse logistics, (Eltayeb *et al.* 2011).

General Plastics popularly known, as "GP" is a limited liability Kenyan Company incorporated in February 1977 and is the premier manufacturer of rigid plastic packaging in Kenya and the East Africa region. The company is competitive to produce packaging designs that are unprecedented in Kenya. Today General Plastics Limited has become one of the largest and leading rigid plastic packaging manufacturers in East Africa and its activities are based at 2 ultra-modern plants in Nairobi, one on Wajir Road in the Industrial Area and the other larger plant on

Enterprise Road. The plants have an annual combined processing capacity of over 8,000 M Tons raw material to meet the most challenging requirements and the infrastructure is designed to meet the rising demands of packaging for the next ten years. The raw material for this company are being imported from Saudi Arabia, Far East, South Africa and Europe, are tested to International Standards for quality and used for Pharmaceutical, animal healthcare, cosmetics, and food packaging. The company also engages in recycling and reusing their plastic packaging materials which have been left unused by the final consumers to help conserve the environment and reduce the cost of raw material acquisition.

The company is committed to delivering superior, long-term value to customers, using innovative solutions to minimize total cost of ownership and time to market. Leveraging competitive manufacturing costs, GP continually delivers customer value through multiple initiatives, from design and product introduction to distribution, including optimum utilization of manufacturing assets and inventory pipelines and a superior cost effective supply chain allows the company to benefit the customers.

1.1.2 Organizational Performance

Organizational performance is the analysis of the actual results or output of an organization measured against its intended outputs. According to Richard *et al*. (2009) organizational performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment.); product market performance (sales, market share.); and shareholder return (total shareholder return, economic value added)

A key performance indicator is a quantifiable measure a company uses to determine how well it meets the set organizational goals. Using financial indicators in business performance measurement allows an organization to compare different business types. An organization can define its own operating objectives and use them to evaluate their performance. Some of the measures it can use include: Activity ratios evaluate how efficiently the company manages its business. The asset turnover measures how effectively the company puts its assets to work. The inventory turnover evaluates how efficiently the company manages its inventory. A higher turnover means better performance for both ratios. Value added is calculated as the difference between the operating result and the cost of capital of the average net assets. Alternatively, the

value added can be determined by using the main value drivers: return on sales and net assets' Return on sales is of particular importance for assessing profitability. The combination of return on sales and net assets' productivity results in return on net assets (RONA). If RONA exceeds the cost of capital, value is created for shareholders (Huselid, 1995). Marketing performance indicators show how an organization's product is performing in the market. Some of the key market performance indicators employed by firms include; the status of existing customers. A well performing product would have a sizeable number of loyal customers and would keep attracting new customers as well. The waiting time for customer orders is also a good indicator of product performance in the market.

Well performing products have regular orders as has been generally observed. The length of stock-outs is another good performance indicator. A stock out is an event that causes inventory to be exhausted. This is usually an indicator of the high demand of the product. In this study, the association between reverse logistics and organizational performance will be determined. According to (Myla, 2010) organizational performance can be indicated by the cost effective control alternatives applied to rectify cost inefficiencies or, in short, minimize costs while maximizing profits. She further points out that the cost control initiatives should not impact the customer's perceived value, nor should they run afoul of safety laws.

1.2 Statement of the problem

Traditionally, organizations have focused on improving forward logistics activities; most have not treated reverse logistics process with the same care and diligence afforded to traditional areas of logistics. Reverse logistics can contribute to efficiency and effectiveness in organizations that practice the same, yet this has not been the case even in General Plastics Kenya. Studies conducted to examine the association between reverse logistics activities failed to holistically measure the reverse logistics phenomenon that include remanufacturing, recycling and reuse in General plastics industry. On different studies to establish the association between remanufacturing and performance, it was established that the key variables in remanufacturing such as setting up of warehouse for storage parts, refurbishing and issuance of warranty were left out. They were also not linked to efficiency and effectiveness. Other studies also explored recycling on performance; however, such studies were found to be very inconsistent and also failed to link remanufacturing, recycling and reuse to organizational performance in General

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plastics industry. Moreover, some study that looked into reuse on performance established that reuse contributed to organization efficiency and effectiveness. The study however used descriptive survey leaving out case study design yet both have their merits and demerits. This study was be conducted to establish the association between reverse logistics and organizational performance focusing on remanufacturing, recycling and reuse and how they impact performance at General Plastics Limited in Nairobi, Kenya.

1.3 Objectives of the Study

The main objective of the study was to find out the association between reverse logistics and organizational performance of General Plastics Limited in Nairobi, Kenya.

1.3.1 Specific Objectives of the Study

The study was guided by the following specific objectives

i. To establish the association between remanufacturing and organizational performance at General Plastics Limited.

ii. To examine the association between recycling and organizational performance at General Plastics Limited.

iii. To determine the association between reuse and organizational performance at General Plastics Limited.

1.4 Research Questions

The study expected outcome were achieved through a concerted effort to finding solutions to the following set of research questions.

i. What is the association between remanufacturing and organization performance at General Plastics Limited?

ii. To what extent does recycling associate with organization performance at General Plastics Limited?

iii. To what extent does reuse associate with organizational performance at General Plastics Limited?

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1.5 Scope of the Study

The study focused mainly on reverse logistics and performance at General Plastics Limited located in Nairobi. General Plastics Limited, popularly known, as "GP" is a limited liability Kenyan Company incorporated in February 1977. With over thirty years of experience, the company is competitive to produce packaging designs that are unprecedented in Kenya. Today General Plastics Limited has become one of the largest and leading rigid plastic packaging manufacturers in East Africa. The company's activities are based at 2 ultra-modern plants in Nairobi, Kenya.

GP has an enviable product range with a capacity to supply an assortment of functional shapes for Cosmetic, Chemical, Pharmaceutical, Lubricant oil, Food and Edible oil industry as well as wide range of standard shapes.

Apart from catering to the needs of the domestic market, General Plastics exports its products to various countries such as Tanzania, Uganda. Rwanda, Ethiopia and Madagascar etc and the products have been well accepted in the export market. GP's products are well known for quality and durability.

1.6 Significance of the Study

The findings of this study will be of great importance to the management of this company under study and other manufacturing companies not covered in this study but engage in reverse logistics. The study findings could provide valuable insight into how reverse logistics helps in environmental conservation and make management of manufacturing companies understand the benefits that accrue to an organization which engages in reverse logistics activities or practices. The results can also be used by other upcoming manufacturing industries to devise effective ways to recycle their end products that remain unused by the final consumers and also help in proper disposal of refuse.

1.7 Conceptual Framework

Figure 1.1 shown below is a conceptual framework underpinning the current study. The figure operationalizes the variables of the study. The variables on the left are the independent variables the one in the middle is the intervening variable while those at the right are the dependent

variables. In remanufacturing, setting up repair workshop, training employees on repair, refurbishing and setting warehouse for storage of parts reduce the cost of production. As such efficiency and effectiveness is ensured. On the other hand, structured incentives, creating awareness and recycling policy ensures that recycling is both efficient and effective. Designing products for reuse, returning used products for reuse and eliminating disposal cost ensures that little resources are used to produce maximum outfit. Performance is measured in terms of the degree to which an organization is successful in producing a desired result (effectiveness). It can also be measured in terms of level of performance that describes the process that uses the lowest amount of inputs to create greatest amount of outputs (efficiency). Efficiency is an important attribute because all inputs are scarce. Time, money and raw material are limited; therefore it makes sense to try to conserve them while maintaining an acceptable level of output or general production level. The set reverse logistic activities must however be in line with government policy for them to be operationalizes by the respective organizations.
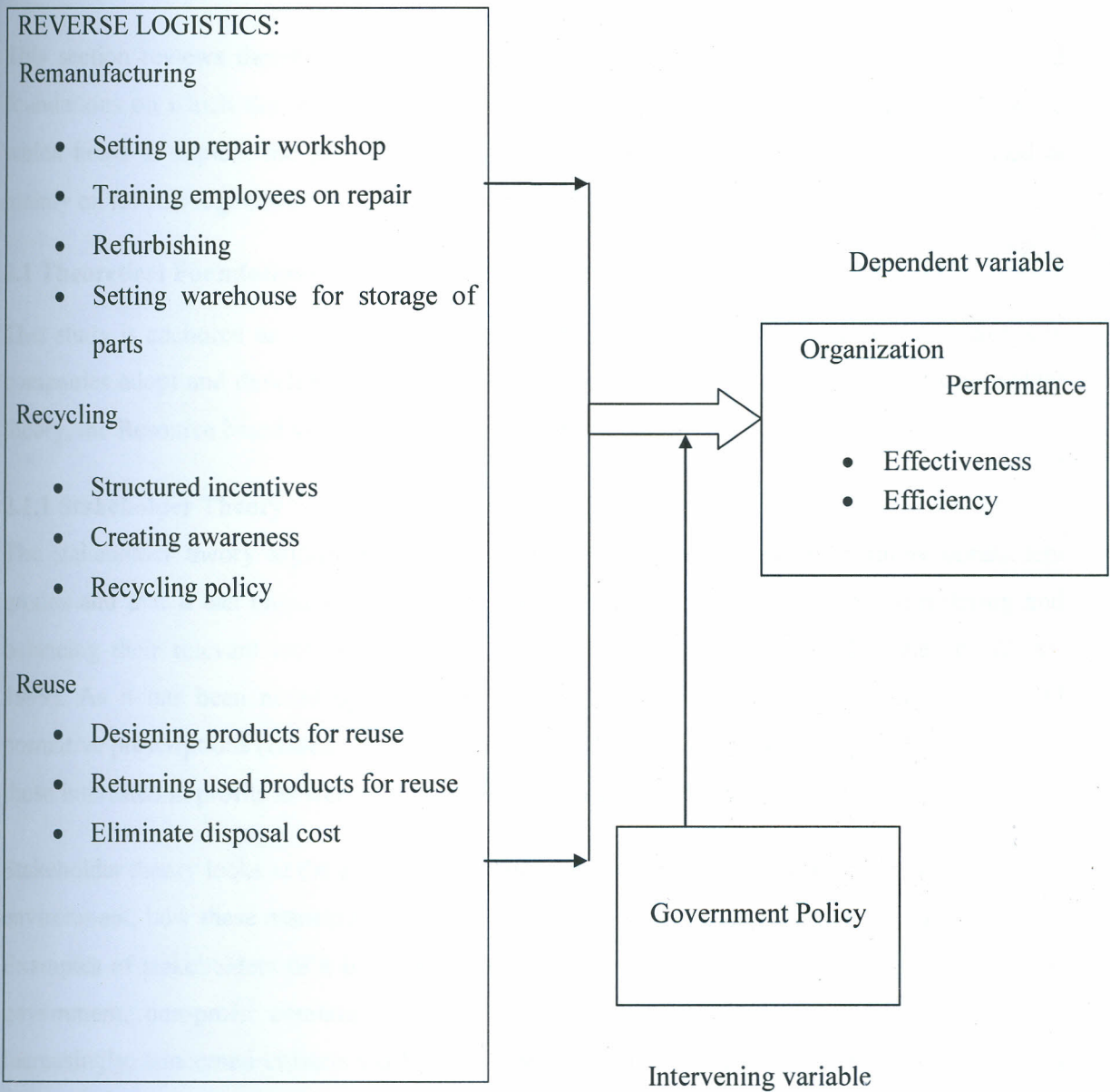
Independent variable

REVERSE LOGISTICS:

Remanufacturing

- Setting up repair workshop
- Training employees on repair
- Refurbishing
- Setting warehouse for storage of parts

Recycling

- Structured incentives
- Creating awareness
- Recycling policy

Reuse

- Designing products for reuse
- Returning used products for reuse
- Eliminate disposal cost

Dependent variable

Organization
                    Performance

- Effectiveness
- Efficiency

Government Policy

Intervening variable

Figure 1: Conceptual framework : Author (2015)

CHAPTER TWO

LITERATURE REVIEW

This section reviews theoretical literature and empirical studies. It focuses on the theoretical foundations on which the study was be built. It also explores comparative empirical literature which helps to explain the gap which the study seeks to address. The literature discussed is mainly on reverse logistics and organizational performance.

2.1 Theoretical Foundations of the Study

This study is anchored on three organizational theories that have been used to understand how companies adopt and develop reverse logistics practices. The three theories are the stakeholder theory, the Resource based view and Institutional theory.

2.1.1 Stakeholder Theory

The stakeholder theory argues that the organization has associations with many constituent groups and that it can engender and maintain the support of these groups by considering and balancing their relevant interests (Clarkson, 1998; Freeman & Evan, 1991; Jones & Wicks, 1999). As it has been noted by many, the theory fosters both instrumental predictions and normative prescriptions (Hasnas, 1998). This has therefore proven to be a subject of interest with those interested in profits as well as those interested in issues of ethics.

Stakeholder theory looks at the associations between an organization and its internal and external environment, how these associations affect the organization's mode of conducting its activities. Examples of stakeholders of a business include suppliers, customers, stockholders, employees, government, non-profit community organizations, and the local community among others. Increasingly, concerned citizens world-wide have reacted to threats of environmental depletion and urged both government and businesses to respond to these issues. This has led to increased demand for 'green' products and calls for more stringent regulations on environmental pollution (Delmas & Toffel, 2004).

An organization can take either a proactive or reactive approach to meet stakeholder demands. Henriques and Sadorsky (1999) support the idea that environmental proactivity is associated with higher pressures from organizational stakeholders (for instance suppliers, customers,

shareholders, employees) and community stakeholders (for example NGO's, social groups), whereas environmental reactivity is associated with higher pressures from the media and regulatory stakeholders (for instance trade associations, governments). Buysse and Verbeke (2003) introduced the distinction between internal primary stakeholders (shareholders, employees, and financial institutions) and external primary stakeholders (customers and suppliers) and made an observation that only the former group motivates environmental proactively. This was as a result of studying producers of intermediate products who had scarce consumer contact.

2.1.2 Resource Based View

The Resource-based View (RBV) is considered as one of the most influential theories in strategic management. The term ''resource'' is broad in nature, in that it refers to not only physical (tangible) assets, such as equipment, plants, and location, but also to intangible assets, such as management skill, knowledge, and organizational assets (Dietrich and Krafft, 2012). Resource based theory views the firm as a bundle of idiosyncratic resources and assets, which emphasizes the use of rate, valuable, in-imitable, and un-substitutable resources to gain sustainable competitive advantage.

Resource-based view was developed in the work by Barney (1986), Teece (1988), and Teece & Pisano (1994), for analyzing firm behavior and competitive strategy (Mowery, Oxley & Silverman, 1998). The RBV contends that the idiosyncratic resources and capabilities of firms are the key sources of sustained competitive advantage (Lynch, Keller & Ozment 2000). This premise appears to be supported by logistics and SCM research (such as Lynch et al. 2000). According to Barney (1991) resources can be classified into organizational capital resources, physical capital resources and human capital resources. Capabilities can be defined as the skills a firm needs to take full advantage of its assets.

Sehgal (2010) noted that resource-based view investigates the importance of internal resources in determining firm actions to create and maintain a competitive advantage and improve performance. However, only possessing such resources does not guarantee the development of competitive advantage or the creation of value. To obtain superior performance, firms must effectively manage, allocate, and exploit resources. More specifically, firms that are able to

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correctly match resources to specific programs and events or to environmental opportunities are more likely to develop capabilities that result in better performance (Sehgal, 2010)

Capabilities are complex bundles of individual skills, assets and accumulated knowledge exercised through organizational processes that enable firms to co-ordinate activities and make use of their resources (Olavarrieta & Ellinger, 1997). Tibben-Lembke (2002) describes the three generic strategies for competing in the marketplace as low-cost leadership, differentiation and focus. One avenue of creating a competitive advantage with differentiation is through building a brand reputation (Grant, 1991).

An organization may choose to focus on implementing reverse logistics practices to expose the negative environmental performance of its competitors. In this way, the organization can cut a niche for its products. Developing and implementing reverse logistics practices can only be achieved through creating environmentally responsible policies and investing in the necessary equipment and training. Creating a competitive advantage through implementing reverse logistics practices would lead to improved market share and consequently higher profit margins (Fortes, 2009).

2.1.3 Institutional Theory

The institutional theory is concerned with the processes by which structures, routines, rules and norms become established as the guidelines for acceptable behaviour. Organizations act in a way that fulfils both customer and legal requirement. Pressures from these two parties influence the adoption of environmentally responsible behaviour (Laosirihongthong *et al.* 2013). Organizations have institutionalized reverse logistics practices because of internal and external pressures. As Carter, Smeltzer & Narasimhan, (2000) observed, companies institutionalize reverse logistics practices due to fear of loss of their market share to competitors and also awareness of the consequences of noncompliance with environmental imperatives (Carter *et al.* 2000). This is over and above growing demand of customers and environmental societies for more environmentally friendly products. These challenges and pressures push firms to seriously considering environmental impacts while doing their business. Managerial decisions to adopt environmental management initiatives maybe influenced by three institutional mechanisms: normative, coercive and mimetic (Di Maggio & Powell, 1983). Due to normative pressures, such as customer requirements, organizations are forced to conform to be perceived as more

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legitimate (Zhu & Sarkis, 2004). Several external stakeholders can also impose coercive pressures on companies, depending on their power. Government bodies may for instance affect the adoption of environmental practices by firms by means of stringent environmental regulation (Delmas, 2002). Managers may also institute environmental practices as a strategy to mimic and 18 outperform competition whose environmental responsibility has earned them a competitive edge (Zhu *et al.* 2007).

2.2 The Concept of Reverse Logistics Practices

Reverse logistics is the term commonly used to describe end of life product management. This means that it is mainly concerned with return or take-back products and materials from the point of consumption to the forward supply chain for the purpose of recycling, reuse, remanufacture, repair, refurbishing or safe disposal (Carter & Ellram, 1998). Reverse logistics focuses on getting product back from customers rather than moving products to customers. Broadly defined, it includes shipments of packaging waste, recyclable packages and customer returns in the logistics system. It emphasizes source reduction and substitution over reuse and recycling (Wu & Dunn, 1995). This refers to doing the same things with less resources hence eliminating waste. There are three broad concepts on which reverse logistics is based according to (Eltayeb *et al.* 2011) and these are reuse, remanufacturing and recycling.

According to Nimawat and Namdev (2012), reverse logistics refers to the role of logistics in product returns, source reduction, recycling, materials substitution, reuse of materials, waste disposal, repair and remanufacturing. It is a system for the recovery of used materials and products. Organizations can implement reverse logistics through recycling and waste logistics which can be established according to the actual need for the collection, classification, processing, packaging, handling, storage, and distribution to specialized treatment facility for processing (Zhang and Zheng, 2010). According to 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.

For company that accept return as a strategy to gain customer loyalty through repeat buyers, reverse logistics is a fundamental process to recover reusables for gaining additional revenue which inherently reduces cost of goods (Mollenkopf and Weathersby, 2003). Other than

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completing the supply chain loop so that products are handled at the benefit of environment, it is also important that products are recovered to cater for demand of after sales services so that cost of purchasing parts can be minimized.

Implementing reverse logistics incurs costs for transportation, recycling, reuse and/or remanufacturing. The resulting economic benefits may not be immediately recognized and quantified, but these benefits may emerge over the time and in multiple forms eventually surpassing the initial investment and the operating costs incurred. In a different domain, the claim of Crosby (1979) that "quality is free" (i.e., the view underlying programs such as "zero defects" and "zero waste"), has been applied to environmentally responsible operations by King and Lenox (2002). This argument posits that the reduction of waste yields benefits that can fully offset the related costs. Chandrasekhar, Dougless and Avery (1999) applied a similar argument, noting that environmental responsibility is free based on an analysis of cost reductions. In a more recent study, Reed and Chiang (2012) developed and detailed strategies for gaining competitive advantage through sustainable business practices.

Melbin (1995) determined that firms practicing reverse logistics secured other benefits beyond the psychological satisfaction of supporting social causes by reducing the environmental impact of their activities and eliminating waste. These firms can also benefit from stronger customer loyalty due to being perceived as an environmentally aware organization—which can ultimately increase firm revenue and income. Otago (2009) argued in his findings on green supply management that GSCM helps reduce the ecological impacts of industrial activities thereby enhancing environmental performance.

According to Lau and Wang (2009), the cost, knowledge and inconsistent inputs are factors that inhibit the development of reverse logistics among manufacturers in environmental and operational performance, such as environmental regulatory compliance, improved customer relations, assets recovery, cost containment, improved profitability and reduced inventory investment (Daugherty, Autry and Ellinger, 2001.

Reverse logistics requires integration of various business functions especially product design department to maximize the value of recoverables. Based on Chan & Fang (2007), there are four ascending levels for measuring a firm's environmental management and ecosystem friendly, at

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the highest level is measured by reverse logistics practices such as recovery of materials and products for a prolonged lifecycle. Their study revealed that proactivity in protecting the environment contributes economic benefits.

Zhu and Sarkis (2007) conducted a study within Chinese environment whereby reverse logistics was described as investment recovery where sales of used and excess material or equipment are useful to liquidate assets but such interpretation inadequately describes the advantage of green and sustainable activity.

2.2.1 Association between Remanufacturing and Performance

Remanufacturing is central to reverse logistics. It enables systematic evaluation of a product with the purpose of reapplication. Moreover, remanufacturing preserves the identity of the product and brings the condition back to new after some operations such as dismantling of the product, restoration and replacement of components. Remanufacturing provides benefits to the manufacturer/remanufacturer by using little resources to produce quality products (Lund, 2000). In remanufacturing, a product is collected from the field, assessed and there after either repaired, refurbished or overhauled. This entails replacing the defective parts of the product with refurbished or new parts. Remanufacture takes place when there is no possibility of direct reuse of the product or such a reuse is no longer economical. If managed properly, remanufacture can generate lucrative business opportunities through recapturing otherwise lost value thereby boosting organizational performance (Toffel, 2004). Empirical studies regarding remanufacturing have however been limited and fail to address the remanufacturing phenomenon.

For instance, in a descriptive survey research conducted Azevedo *et al.* (2011) to identify the influence of remanufacturing on the performance of electronic industry; it was found that remanufacturing was both effective and efficient because little resources were used to produce optimal quality. Even though remanufacturing contributed to organization performance in this study, it fails to show which variables were measured such as setting up repair workshop. The study also used descriptive survey design which concentrated on a number of electronic establishments and therefore in-depth analysis is lacking when compared to case studies.

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Additionally, remanufactured products can only be as good as the employees tasked to do the repair work. It follows that training employees on repair for the returned goods underpins the success of the entire reverse logistics (Stokes & Clegg, 2002) on their study to establish the influence of employee training for repair work and its impact on performance, Srivastava & Srivastava (2006) established that highly trained employees contributed significantly to organizational financial performance. Even though training of employees contributed to organizational performance according to this study, it only concentrated on one aspect of organizational performance. It therefore failed to measure training of employees for repair work on organization efficiency and effectiveness.

Furthermore, refurbishment contributes significantly in reverse logistics. The essence of refurbishment is to renovate and re decorate the product so that it is difficult to separate it with brand new product either by its aesthetic disposition or by the quality of its content (Zailani & Ramayan, 2011). Studies have however been conducted refurbishment phenomenon. For instance, a study conducted by Nimawat and Namdev (2012) to determine how refurbishment contribute to cost of production in a soft drink bottle company, it was found that refurbishment had reduced the cost of manufacturing by 60% for every product refurbished. But on a different research conducted by Zhang and Zheng (2010), production cost reduced by 20% for every product refurbished. Apart from the wide margins in these two researches, it is not clear which kind of measurement was used to record performance. Performance measurement differs from organization to organization depending on the comprehensive objective of the organization in question (Dekker & Flapper 2005).

According to Holt (2005), performance is measured in terms of the degree to which an organization is successful in producing a desired result (effectiveness). It can also be measured in terms of level of performance that describes the process that uses the lowest amount of inputs to create greatest amount of outputs (efficiency). Efficiency is an important attribute because all inputs are scarce. Time, money and raw material are limited; therefore it makes sense to try to conserve them while maintaining an acceptable level of output or general production level. All these contribute to increased productivity (Mohr, 1996). This measure of performance is however not holistic since other organizations measure performance in terms of profit margins and market penetration.

Moreover, warehousing ensures effective handling in reverse logistics. Warehousing corresponds to storage of parts before the various operations they will be submitted to. Now-a-days, the warehouses are operated using mechanical appliances which can easily handle the goods. Thus, heavy and bulky goods are handled easily without any breakage. This reduces the handling costs and also reduces the wastage of labor which in turn ensures efficiency and effectiveness (Autry & Ellinger, 2001). Lau and Wang (2009) concur in their empirical survey on the effect of warehousing on transportation. It was established that warehousing had reduced the cost of transportation by 30% for the companies that had their warehouses closer to the manufacturing plant. Even though warehousing was found to reduce the cost of transportation, this study only concentrated on warehousing vis-à-vis transportation leaving out setting warehousing for storage parts on efficiency and effectiveness of organization.

Vinzi (2012) asserts that issuance of warranty is central to performance in reverse logistics. Issuance of warranty ensures that consumers can bring back the products for replacements or incentives thereby reducing several associated costs such as collection and transportation costs. Autry, Daugherty & Richey, (2001) established that the companies that had more than 12 months and above warranty recorded increased return on sales (ROS). Zhu and Sarkis (2007) however established that financial performance as a result of issuance of warranty was less measurable independently but no less profound in the reverse logistics practices.

In summary, these studies have failed to measure specific variables of remanufacturing on organizational efficiency and effectiveness. In particular, the studies have failed to link directly setting of repair workshops and organizational performance. In the same domain, the studies have failed to indicate how training of employees on repair of the returned products relates with organizational performance. Similarly, refurbishment, warehousing of parts and issuance of warranty have also not been linked directly with organizational performance.

2.2.2 Association between Recycling and Organizational Performance

Recycling is also a key activity in the reverse logistics process. Recycling is the process of recovering any piece of a returned product that may contain value. In recycling, collected used products are disassembled and useful material extracted from them. The identity and functionality of the original material is lost (Eltayeb *et al.* 2011). An empirical research

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conducted using a descriptive survey design by Lund (1995) established that recycling reduced the overall cost of manufacturing thereby contributing to efficiency and effectiveness. But another descriptive survey designed conducted by Srivastava & Srivastava (2006) differs. They established that the cost remained relatively the same because, like production, recycling came with costs such as transportation costs, recycling costs, and storage costs among others. These studies fail to indicate whether the products were plastics or glasses. But more fundamentally, the studies fail to show the specific variable of recycling that was measured such as well documented recycling policy and how it impacts organization effectiveness.

Creating awareness is also central to recycling. Awareness enables the customers from the market segment served by the products to know the recyclability of such products (Rao & Holt, 2005) in an empirical research to establish how awareness creation in recycling contributed to performance, Laosirihongthong et al. (2013) established that by creating awareness for recyclable products, market share growth increased by 40% on that particular financial year. Eltayeb *et al*. (2011) however established that awareness creation increased market performance not because of the recyclability of the product, but because of the usefulness of the product in question. These studies concentrated on awareness creation on market performance leaving out awareness creation of the recyclability of the product on efficiency and effectiveness of the organization.

For recycling to contribute to performance in the contemporary organization, it has to be underpinned by well documented recycling policy. The principles of action inherent in a policy document allow the organization employees to meet the specifications of recycling and thereby reduce costs which why recycling activity is undertaken (Zhang and Zheng, 2010). On a study to establish how organizational policies contribute to organizational financial performance, it was found out that organization policy contributed to performance because every action was aligned to principles of action that had been established by the organization research and development department. This study however is too general; it measures the entire organizational policy and fails to particularly concentrate on recycling policy on organizational performance.

But recycling can only be possible if the products that are with end users are available for recycling. It brings to the fore the imperativeness of structured market incentives. Essentially,

market incentives encourage the end users of the product to take back which they no longer use for whatever reason to be recycled (Dekker & Flapper 2005). On their study, Eltayeb *et al.* (2011) established that structured market incentives encouraged customers of drinking water Company to take back their water bottles for recycling. This study however failed to show how such incentives impact on organization performance.

2.2.3 Association between Reuse and Organizational Performance.

Product reuse is the process of collecting completely unused or slightly used products from the consumer and injecting them back into the supply chain without any upgrade or processing. Practices under reuse include return of used products and packaging to suppliers for reuse, setting of quality standards for reuse, generating energy from renewable sources of energy and designing products for reuse. The ultimate value of the product is therefore reduced (Eltayeb *et al.* 2011).

In a study conducted by Rao & Holt (2005), it was established that setting quality standards for reuse improved product quality and reduced waste. Toffel, (2004) however posted different findings in his study. It was established that cases where completely unused or slightly used products were rare and could not be relied upon by organizations for quality enhancement. These studies however fail to these studies however only concentrated on quality standards for reuse on enhancing product quality leaving out setting quality standards for reuse on organizational performance.

Designing products for reuse is as well a great strategy in ensuring organizational performance. Whenever customers take back the products or packaging to the suppliers for reuse, the general cost of the producing similar products and packaging materials are reduced tremendously (Dougless & Avery,1999). In a study conducted by Melbin, (1995) it was established that designing products for reuse greatly increased profit margins of the organizations sampled. Another study conducted by Dougless & Avery (1999) established that the percentage of profitability in designing products for reuse was less measurable independently but no less profound. These studies however measured designing products for reuse on organization profitability leaving out designing products for reuse on organizational performance.

Reduced landfill activities ensure that associated costs are reduced. Bins and reusable bags are not quickly consumed and disposed of in landfills and therefore by reusing the same, the costly activities of decomposition and disposal in landfills are reduced Mollenkopf and Weathersby, (2003). In a study to establish how activities of disposing industry rejects contributed to performance, Wu, Dunn, and Forman (2012) established that all the costs associated with disposing industry rejects were eliminated by reuse of the packaging materials. This study however fails to indicate whether efficiency and effectiveness was realized

Furthermore, returning used products and packaging to suppliers for reuse also affect performance affirmatively. When such products are returned to the supplier, costs of remanufacturing new ones are reduced (Zhu and Sarkis, 2007). In their study, Autry & Ellinger, (2001) found out that the goods returned by the consumers were immediately reused by the suppliers and hence customer satisfaction improved by 38% in the financial year. This study however only measured customer satisfaction leaving out organizational performance.

2.3 Empirical Literature Review

Internationally, a number of studies have been done to try and establish the association between reverse logistics practices and organizational performance. Green et al (2011) found out that successful implementation of GSCM practices such as green purchasing, cooperation with customers, Eco design and reverse logistics will lead to improved environmental and economic performance with support improved organizational performance. Further, their findings show that cost saving nature of reverse logistics should lead to improve economic performance and both environmental and economic performance should yield improved operational efficiency.

According to Rao and Holt (2005), green supply chains do give firms competitive advantage and also lead to increased economic performance. They observed that the image of products of firms that practiced reverse logistics in Philippines had been positively affected giving such firms a competitive advantage. Their study mainly focused on the financial outcomes of organizational performance. This is where this study come in to fill the gap as it will focus on how remanufacturing, recycle and reuse could directly impact on performance of General Plastic industry.

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Ogombe (2012) looked at the association between reverse logistics and competitive advantage in water bottling companies in Nairobi. This study concluded that there was a strong association between reverse logistics and competitive advantage. Companies that implemented reverse logistics practices benefited from increased profit margins due to reduction in production codts and increased sales.

Serut (2013) whose main concern was on the financial aspect of organizational performance. Although his study found a positive association between reverse logistics and organizational performance, this study argues that reverse logistics is a broad concept and therefore should be divided into three reverse logistics elements of remanufacture, recycle and reuse. The kind of data he collected was mainly concerned on the financial aspect of an organization's performance, while this study focuses on organizational performance holistically which include efficiency and effectiveness.

2.4 Summary

This review of literature on works linking reverse logistics practices with organizational performance. Over the past decade, most studies on reverse logistics have been done mainly in Asia for example Rao and Holt (2005) and Eltayeb *et al.* (2011) and the developed countries such as Green, Zelbts, Meacham and Bhadauria (2011) in the USA. However, there has been little research carried out on this topic in developing countries such Kenya with firms manufacturing plastics.

From review of literature done on studies on reverse logistics carried out in Kenya, most studies including Srivastava & Srivastava (2006), (Dekker & Flapper 2005) and (Zhang and Zheng, 2010) were only focused one element of reverse logistics.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter describes the proposed research design, study area, target population, sampling and sampling technique and data collection methods and data analysis.

3.1 Research Design

The study employed a correlational case study design. According to Mugenda (1999) the case study design utilizes smaller samples for in-depth analysis to gain insight into larger cases thus its justification for this study as this approach allowed generalizations and hence representativeness.

3.2 Study Area

General Plastics Kenya is located along Enterprise Road off Mombasa Road in Nairobi County. Nairobi is the capital and largest city in Kenya. The city is governed by County Government of Nairobi. With a population of 3.36 million estimated in 2011, Nairobi is the second largest city by population in Africa Great Lakes Region. Majority of Nairobi residents (60%) however are slum dwellers with the population expected to increase because of urbanization. To the equator, Nairobi lies (1°17′S). Economically, the people of Nairobi are mostly employees and entrepreneurs. Nairobi is also headquarters almost all industries and major firms, governmental or otherwise in Kenya. In terms of infrastructure and culture, Nairobi is supplied with good road network and airports including Jomo Kenyatta International Airport which is the best in the region. Nairobi has urban culture which is primarily borrowed from the West (KNBS, 2009).

3.3 Target Population

The target population comprised all the current employees of General Plastics Limited totalling to 900 as shown in Table 3.1.

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Table 3. 1: Target population

Cadre of Staff	Total population
Manager	60
Subordinates	840
Total	**900**

Source: General plastics Limited (2015)

3.4 Sample and Sampling Techniques

The sample comprised 269 employees. The sample was determined according to a table based on Krejcie (1970) model and generated by Morgan (1990). The sample estimation table annexed as Appendix II.

This study adopted stratified random sampling technique. This technique was justified because the population is heterogeneous, that is made of respondents from different cadres of staff and therefore allows each element to be included in the sample. The respondents will be divided into two strata which will be proportionate as shown in Table 3.1.

Table 3. 2: Sample Size

Cadre	Population	Sample
Managers	60	18
Subordinates	840	251
Total	**900**	**269**

Source: General Plastics Limited (2015)

3.5 Data Collection Methods

3.5.1 Source of Data

This study used both primary and secondary data. The primary data was sourced from the data collected from the respondents sampled. Secondary data was sourced from books, journals, publications, abstracts and the internet.

3.5.2 Data Collection Procedures

The researcher first obtained letter of introduction endorsed by University. The researcher then contacted the relevant officer at the General Plastics Limited to make prior arrangements before

the actual data collection. The study collected both qualitative and quantitative data. Data was collected using a self-administered questionnaire. Semi-structured questions was an effort to conserve time and money as well as to facilitate in easier analysis as they are in immediate useable form; while the unstructured questions were used so as to encourage the respondents to give an in-depth and fill responses without feeling held back in revealing the information (Chandran, 2003).

3.5.3 Data Collection Instruments

The instrument of data collection in this study was a questionnaire as it has the ability to gather data of large sample size, save time, and uphold confidentiality of the respondents.

3.5.4 Reliability and Validity of Instruments

To establish the validity of the research instrument, the researcher sought opinions of experts in the field of study. This facilitated the necessary revision and modification of the research instrument thereby enhancing validity. Reliability was obtained using Cronbach's alpha formula where a coefficient of 0.848 was obtained as illustrated in the generated below. This illustrates that the instrument was reliable as the coefficient exceeded the prescribed threshold of 0.6. Mugenda and Mugenda (2003) a high coefficient of above 0.6 implies consistency.

Table 3. 3: Reliability test

Cronbach's Alpha	0.658914729
Split-Half (odd-even) Correlation	**0.848204883**
Spearman-Brown Prophecy	0.917868891
Mean for Test	15
Standard Deviation for Test	4.636809248
KR20	4.069767442

Questions	Subjects
4	4

	Question 1	Question 2	Question 3	Question 4
Subject1	5	5	5	5
Subject2	5	4	5	5
Subject3	4	4	4	0
Subject4	5	4	0	0

Source: *Reliability Calculator (created by Del Siegle del.siegle@uconn.ed for EPSY 5601)*

3.6 Data Analysis and Presentation

The questionnaire was checked for accuracy, consistency and completeness. Descriptive statistics like mean and standard deviation and inferential statistic such as correlation models was used to analyse data and the data presented in form of tables.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents, analyses, interprets and discusses the results on the association between reverse logistics and performance of General Plastics Limited in Kenya.

4.2 Response rate

The study managed to obtain 233 completed questionnaires representing 85.5% response rate. This was a very good degree of response, according to Edwards et al.,(2000) a questionnaire return rate of 80 percent and above is satisfactory, while 60 percent to 80 percent return rate is barely acceptable.

4.3 Extent of adoption of Reverse logistics practises and organizational performance

The study sought to establish the extent of adoption of reverse logistics practices in General plastics limited. Respondents were requested to state the extent of adoption of indicators of elements of reverse logistics practices including remanufacture, recycling and reuse. A 5-point Likert scale was used to rate the extent of adoption of the elements of these indicators whereby 1 was accorded to 'very low', 2 'low', 3 'moderate', 4 'high' and 5 'very high'.

4.3.1 Remanufacturing reverse logistics practises

The study accessed the level of adoption of remanufacturing practise elements at General plastics Limited and the results are presented in table 4.1.

Table 4. 1: Extent of adoption of remanufacturing reverse logistics practises

Remanufacturing Elements	Mean	SD
Setting up warehouse for storage of parts	3.88	1.39
Setting up repair workshop	3.79	1.11
Training employee on repair	3.72	1.21
Refurbishing	3.69	1.13
Grand Mean	**3.77**	**1.21**

Source, Research Data (2015)

The study established that the firm adopted remanufacturing to a high extent evidenced by a weighted mean of 3.77 and SD of 1.21. The respondents acknowledged that the organization had set up warehouse for storage of parts and set up repair workshop given by a mean of 3.88 and 3.79 respectively. The respondents also acknowledge the firm was carrying out a training of its employees on repair and also doing refurbishing as given by means of 3.72 and 3.69.

4.3.2 Recycling reverse logistics practises

Recycling was also assessed to determine the level of its elements adoption and the results are presented in table 4.2.

Table 4. 2: Extent of recycling reverse logistics practices

Recycling elements	Mean	SD
Returning used goods and packaging for supplier	4.20	0.89
Create awareness	4.10	0.86
Well documented recycling policy	3.90	0.76
Structured market incentives	3.60	0.54
Grand Mean	**3.95**	**0.95**

Source, Research data (2015)

The findings revealed the firm had adopted recycling to a high extent evidenced by a mean of 3.95 and a standard deviation of 0.95. Returning of used goods and packaging for suppliers was revealed to be the most practised recycling element with a mean of 4.20, followed by creating awareness 4.10, well documented recycling policy and lastly structured market incentives with a mean of 3.6.

4.3.3 Reuse reverse logistics practises

Further study also sought to determine the level of adoption of the element of reuse reverse logistics practise and the results are presented in table 4.3;

Table 4. 3: Extent of reuse reverse logistics practises

Reuse Elements	Mean	SD
Setting of quality standards for reuse	4.30	1.3
Design products for reuse	4.00	1.02
Return of used products and packaging to suppliers for reuse.	3.50	0.98
Grand Mean	3.93	1.1

Source, Research Data (2015)

The study revealed that reuse reverse logistics practises was adapted to a high extent as evidenced by a mean of 3.93 and a standard deviation of 1.1. Setting of quality standards for use was found to be the most dominant practise practised to a high extent 4.4 followed by design for reuse practised to high extent and return of used products and packaging to supplies for reuse also practised to a high extent.

4.3.4 Organizational performance

The study also sought to determine the level of organizational performance and the results are presented in the table 4.4.

Table 4. 4: Extent of organizational performance

Organizational Performance Elements	Mean	SD
Effectiveness	4.20	0.91
Efficiency	3.80	0.87
Grand Mean	4.00	0.89

Source, Research data (2015)

The study also established that the organization performed to high extent evidenced by a weighted mean of 4.00. Organizational performance elements were all established to be practised to high extent, effectiveness established to be more dominant with a mean of 4.20 and efficiency with a mean of 3.80.

4.4 Association between remanufacturing and organizational performance

To establish the association between remanufacturing and organizational performance a correlation was done between the two elements. The findings are presented in table 4.5.

Table 4. 5: Association between remanufacturing and organizational performance

Remanufacturing Elements		Performance
Setting up warehouses for storage of parts	Correlation	.623(**)
	Sig. (2-tailed)	.003
Setting up repair workshops	Correlation	.544(**)
	Sig. (2-tailed)	.001
Training employees on repair	Correlation	.751(**)
	Sig. (2-tailed)	.002
Refurbishing	Correlation	.439(**)
	Sig. (2-tailed)	.001

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

Source, Research data (2015)

The Pearson correlation analysis was done for all the study variables showed that there existed a very strong positive correlation between performance and remanufacturing practises at General Plastics Limited at 0.01 (2-tailed) confidence levels.

The study established that the association between setting up warehouses for storage of parts and the organizations performance was highly positive and significant with a coefficient of (r=.623, P=0.003<.05) . This implies that if more warehouses were to be set up for storage of parts there would be an increase of performance. Results from table 4.5 show that the correlation analysis between setting up of repair workshops and performance likewise positive and significant with a coefficient of (r=.544, P=0.001<.05). This implied that if more repair workshops were to be set up then there would be a probability of an increase in performance.

The correlation analysis between training employees on repair and performance also revealed that their association was positive and significant with a coefficient of (r=.755, P=.002<.05). This implied that if more employees were to be trained on repair then there would be a probability of a parallel increase in performance.

The results in table 4.5 show the correlation analysis between refurbishing and performance as being positive and significant with a coefficient of (r=.439, P=.001<.05). This implied that an increase in refurbishment will lead to a probable increase in performance of the organization.

4.5 Association between recycling and organizational performance at General Plastics Kenya.

A correlation was done to establish the association between recycling and organizational performance. The findings are presented in table 4.6.

Table 4. 6: Association between recycling and organizational performance.

Recycling Elements		Performance
Returning used goods and packaging for suppliers	Correlation	.770(**)
	Sig. (2-tailed)	.001
Creating awareness	Correlation	.676(**)
	Sig. (2-tailed)	.001
Well documented recycling policy	Correlation	.242(**)
	Sig. (2-tailed)	.001
Structured market incentives	Correlation	.232(**)
	Sig. (2-tailed)	.004

**. Correlation is significant at the 0.05 level (2-tailed).
Source: Research data (2015)

The findings from table 4.6 of the correlation analysis between returning used goods to suppliers and performance revealed that there is a high positive and strong correlation with a coefficient of (r=.770, P=0.001<.05). This indicated that returning more goods to the supplier would have resulted to a probable increase in performance of the organization positively.

The correlation analysis between creating awareness and performance show that there is a positive and significant association between awareness and performance with a coefficient of (r=.676, P=0.001<.05). This implied that creating more awareness has a probability of increasing performance of the organization positively.

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The finding from table 4.6 further reveal that the correlation analysis between documenting a recycling policy was positive and significant with correlation coefficient of (r=.242, P=0.001<.05).

Moreover the correlation analysis between structured market incentive and performance revealed there that there was a positive and significant association between using of structured market incentives and performance with a correlation coefficient of (r=.232, P=.004<.05). This insinuated that if more structured incentives were introduced by the organization then the performance of the organization would be improved.

4.6 Association between reuse and organizational performance at General Plastics Kenya.

T o facilitate an inferential analysis of the association between the elements of adoption of reverse logistics practices and organizational performance of General Plastics Limited, the respondents were requested to score for indicators of effectiveness and efficiency as performance measurements. Data on the extent of adoption of remanufacturing, recycling and reuse reverse logistics practices were computed and converted into categorical data to be used as independent variables. On the other hand the respondents' score on indicators of effectiveness and efficiency for organizational performance.

After which, a correlation was done to find out the association between reuse and organizational performance. The findings are presented in table 4.7.

Table 4. 7: Association between reuse and organizational performance

Reuse Elements		Performance
Setting of quality standards for reuse	Correlation	.478(**)
	Sig. (2-tailed)	.001
Design products for reuse	Correlation	.776(**)
	Sig. (2-tailed)	.002
Return of used products and packaging to supplies for reuse	Correlation	.942(**)
	Sig. (2-tailed)	.007

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

Source: Research data (2015)

From the findings in table 4.7 the study established that the correlation analysis between setting quality standards for use and performance was positive and significant with a correlation coefficient of (r=.478, P=0.001<.05). This implied that if more quality standards were set then there is a probability that the performance of the organization would improve.

The finding of the correlation analysis between designing product for re use and performance showed that there was a strong and positive association given a correlation coefficient of (r=.942, P=0.002<.05). This implied that if more products were designed for re use would improve the performance of the organization

Further correlation analysis between return of used products packaging to suppliers for reuse showed that there was a highly positive and significant association with a coefficient correlation of (r=.942, P=.007<0.5). This indicated that returning more used products packaging to suppliers for reuse would improve the performance of the organization.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMENDATION

5.1 Introduction

In this chapter, a summary of the research findings, conclusion, recommendation and suggestions for further research are made. The main purpose of this study was to establish if there is a association between reverse logistics and performance of General Plastics Limited in Kenya. Data for analysis was obtained by use of questionnaires designed by the researcher for the managers and subordinate staff within General Plastics Limited. Information obtained was analyzed quantitatively with the aid of statistical package for social sciences (SPSS).

5.2 Summary

From data analysis in chapter four, the study isolates some issues on the association between reverse logistics and performance of General Plastics Limited in Kenya. The contents of the analysis were summarized as follows:

On establishing the association between remanufacturing and organizational performance at General Plastics Limited, the study established that there is a positive and significant association between remanufacturing and organizational performance at General Plastics. The highest significant association was between training of employees and effectiveness. The lowest significant association was between efficiency with setting up repair workshops.

When examining the association between recycling and organizational performance at General Plastics Limited. The study established that there is a positive and significant association between recycling and organizational performance. The highest significant association was that between effectiveness and returning used goods and packaging for suppliers. The lowest significant association was that between efficiency and structured market incentives.

On determining the association between reuse and organizational performance at General Plastics Limited, the study established that there was a positive and significant association between reuse and organizational performance. The highest positive and significant was between designing product for reuse and effectiveness. The lowest significant association was that between effectiveness and setting of quality standards for reuse.

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5. 3 Conclusions

The study concludes that even though all the remanufacturing practises result to organizational performance of General plastics training of employees contributes more to the organizational performance. The study also concludes that even though all the recycling practises contributes to improved organizational performance returning used goods and packaging for suppliers contributes more to the firms effectiveness and efficiency. Lastly the study concludes that even though all the reuse practises contributes to organizational performance, designing products for reuse improves the firm effectives and efficiency more.

5.4 Recommendations

The study recommends that:

The firm should train its employees more of reverse logistics practices to improve its efficiency and effectiveness.

The firm should ensure used goods and packages are returned to the supplier.

The firms should ensure that they design product that can be put into reuse after their first use to prevent a lot of waste in the environment.

5.5 Limitations of the study

The study had the following limitations:

The respondents may not have disclosed important information probably for fear of victimization in case they were being spied or fearing to be copied by competitors hence limiting researcher's recommendations.

Some respondents did not fill and return the questionnaires. This affect the research since most of the respondents were expected to fill to make the results more plausible.

5.6 Suggestions for further studies

Future study may consider investigating:

The state of adoption within different industries as this study focused on large scale manufacturing firms in Nairobi, Kenya only. It is expected that reverse logistics implementation level might depend on the industries that each manufacturing entities are in.

The influences of various factors such as government regulations, environmental awareness or any other factors either as independent or moderating mediating variables that can influence manufacturer's decision in adopting reverse logistics activities.

Appropriate ways to increase formalization of reverse programs and establish reverse logistics as a profit centre within organizations may be the areas in greatest need for additional scholarly research.

A comparative study with another country both in the sub-region, the developed and developing world to ascertain the reverse logistics practices adopted by manufacturing firms and the effect of reverse logistics practices on profitability of manufacturing firms. Then, findings and conclusions can be made based on facts.

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