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Evaluation of the Use of Reverse Logistics on Organizational Profitability: A Case Study of Kenya Power Ltd, Kenya

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Abstract: ***The study focused on the role of reverse logistics (RL) in the overall profitability of the organization with regard to Kenya Power (KP). A descriptive case research design was adopted to establish whether there was a link between RL and profitability. Data was obtained by use of both structured questionnaires and interview schedules targeting employees working in Supply Chain Division of Kenya Power whose population was 156. A simple random sample of 112 respondents was actually used for the questionnaire and 3 top managers were sampled for the interview schedule. Piloting was done on 12 respondents selected using the half split method. Both primary and secondary data obtained was analyzed and presented with the aid of statistical package for social sciences (SPSS), which provided descriptive and inferential statistics. Correlation analysis was engaged to assist in determining whether and how independent and dependent variables related and thereafter content analysis was undertaken to establish the extent of the relationship between reverse logistics and profitability. The study established that reverse logistics activities had a significant contribution to organizational profitability and thereafter concluded that there was need for top management to plan properly, create awareness and direct more resources to reverse logistics activities in order to reap maximum benefit. It recommended for the development and implementation of the disposal plan alongside the procurement plan.***

Keywords: Reverse Logistics, Profitability, Supply Chain, Recycling, Green Products

1. Introduction

The world of logistics has considerably changed due to globalization, modern information technology, and especially increasing ecological awareness. Large supply chain management systems are changing to global logistic networks. Awareness of the art and science of logistics continues to increase due to the increasing need for competitive advantage(Daugherty et al, 2001).Additionally, great interest in RL has been witnessed (Fernandez, 2005). Reverse logistics is a relatively new phenomenon in the research area mainly referring 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 value or proper disposal (Rogers et al, 1999).It is noticeable the emphasis in the direction of the material flow from typical destination to the origin and the purpose of taking economic advantage of reverse logistic. For the Revlog group in Europe, RL refers to all logistic activities to collect, to disassemble and process used products, product parts, and/or materials in order to ensure a sustainable (envi-ronmentally friendly) recovery (REVLOG, 2007). Once a supply chain afterthought, RL is now seen as a supply chain opportunity and has therefore evolved into a highly complex endeavor. This is especially true in the electronics sector, where product lifecycles have dramatically shortened, global service networks create more supply chain complexity, products are highly customized to user preferences and sustainable practices are increasingly required.

Typical reverse logistics activities would be the processes an organisation uses to collect used, damaged, unwanted (stock balancing returns), or out-dated products, as well as packaging and shipping materials from the end-user or the reseller. The larger issue common to all of these activities is how the organisation should effectively and efficiently get the products from where they are not wanted to where they can be processed, reused, and salvaged. Also, the organisation must determine the "disposition" of each product. That is, for each product, the organisation must decide the final destination for products inserted into the reverse logistics flow. The growing environmental concern worldwide has forced organizations to engage in RL, such as product recalls, reclamation and recycling. Ideally, most of the organizations deal with returns of some nature because of issues such as marketing returns, damage or quality problems, overstocks, refurbishing or remanufacturing. Handling returns present a great challenge for organizations, while in many cases becomes a necessity for keeping users' satisfaction to a certain level. Reverse logistics operations in a supply chain may be considered as an introduction to innovative services of an organisation's portfolio. Such services include capturing value, proper disposal, remanufacturing, and refurbishment. They may have an important impact on an organisation's strategic performance in terms of market effectiveness, as well as, internal cost efficiency.

In Kenya, NEMA was established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment. Legal disposal issues are a major concern for many organisations. As landfill fees increase, and options for disposal of hazardous material decrease, legally disposing of non-salvageable materials becomes more difficult. Organizations have to think carefully about these issues.

Historically, most of the attention paid to product management has focused on the introductory phase or on volume-shipping portion of the product life cycle. Although many organizations already have strategies to deal with this problem, some of them are not good enough and require changes. In Kenya most organisations have not inculcated RL strategies in their operations. At Rift Valley Railways for example, large volumes of scrap metal dot every available space in their yards. Joel et al, (2012) observe that poor handling of RL is partly to blame for the pollution of major rivers particularly those traversing the urban areas.

For many industries, learning to manage the reverse flow is of prime importance. A good RL strategy is needed to cope with this return to gain the most benefits. According to (Vaidyanathan et al, 2007), firms that do not recognize the importance of an effective RL strategy as part of their value chain risk damaging customer relations and may seriously jeopardize their brand image and reputation. These strategies need continuous improvement to help organizations build more competitive advantages. The leaders have greatly broadened this perspective by differentiating between a product's success (and profitability) and failure. This depends on how the end of life is managed, and the business importance of taking good care of users. They know that user satisfaction holds the key to long-term success and that enabling them to return products without penalty is a big part of the equation (Rogers et al, 2013).

At the same time, emerging nations are drafting laws requiring manufacturers to recycle unsold goods. This will further complicate a supply chain based on point-of-sale imperatives. Lack of infrastructure in some of the more remote regions of Kenya makes it almost impossible to regain any margin on the reverse cycle.Possible hypothetical reasons include lack of information, lack of perceived or achievable economic advantages, high costs, organizational barriers, cultural constraints and sector of business. The predominant view seems to be that, RL poses a burden on the organization, generating moreover additional costs from the specific operations needed such as collection, sorting and storage. At KP, the RL process can be broken into two general areas, depending on whether the reverse flow consists primarily of products, or primarily of packaging. For product returns, a high percentage is represented by user returns. Overall user returns are estimated to be approximately six per cent across all regions. It therefore holds that learning to manage the reverse flow is of prime importance.

2. Statement of the Problem

Kenya Power has witnessed a tremendous increase in inventories since the year 2007 in tandem with a rapid growth of the distribution network together with the customer base. However this growth has seen a major decline of proceeds from disposal of property and equipment contrary to expectations. Delays to dispose obsolete, surplus and or unserviceable materials has led to increased accumulation of scrap in the various stores countrywide, material shortages and increased the risks to life and environmental degradation as reported in the EHS Audit report of October 2013. The total value of scrap at KP has not been established but is estimated to be billions of shillings. In the study, an attempt has be made to isolate and accurately account for the revenues attributed to disposals from the total revenues declared and compare these figures with potential and realized revenues. Ideally more than half of inventory has the potential of being returned for disposal. This has not been realized. These are symptoms of a lapse in the execution of the return strategy, which is compounded by the lack of a disposal plan and staff specifically tasked with the management of RL in the company. As to whether effective RL management can bridge this gap is what has come out of the study in this paper since not much research work has been done in this area.

3. Objectives of the Study

The study had both the general and specific objectives.

3.1 General objective

The study aimed at evaluating the use of reverse logistics on profitability at Kenya Power.

3.2 Specific objectives

The study was guided by the following specific objectives.

i. To investigate the contribution of reverse logistics on profitability at Kenya Power.
ii. To assess the relationship between cost of reverse logistics and profitability of Kenya Power.
iii. To evaluate the effect of reverse logistics drivers on profitability at Kenya Power.
iv. To determine the strategies available to minimize waste at Kenya Power.

4. Research Hypotheses

The study was guided by the following research Hypotheses

i. $\mathbf{H_{01}}$**:** $\mu_1 = \mu_2$:Reverse logistics does not significantly contribute to the gross profit of Kenya Power.
ii. $\mathbf{H_{02}}$**:** $\mu_1 = \mu_2$:Cost of reverse logistics has no significant impact on profitability at Kenya Power.
iii. $\mathbf{H_{03}}$**:** $\mu_1 = \mu_2$:There is no significant relationship between drivers of reverse logistics and profitability at Kenya Power.
iv. $\mathbf{H_{04}}$**:** $< \mu_2$:Available strategies will not minimize waste at Kenya Power.

5. Conceptual Framework

The conceptual framework illustrates how the independent variables relate to the dependent variables. The independent variables of the study were Contribution, Cost, Drivers and Strategies while the dependent variable of the study was profitability.

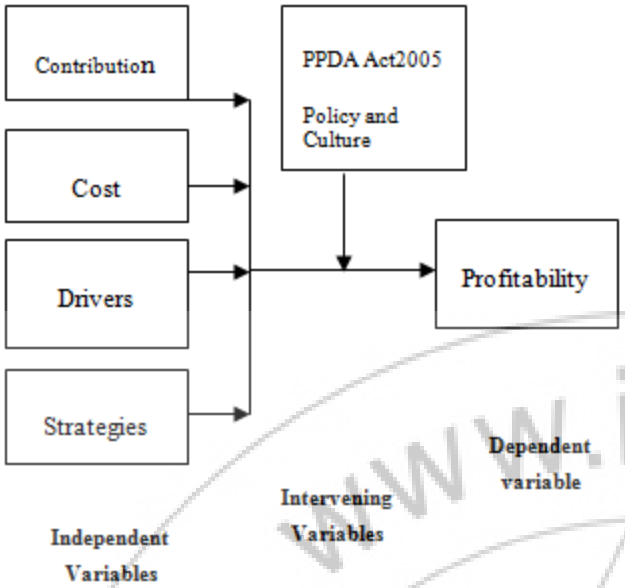

Figure 1: Conceptual Framework

6. Literature Review

In this chapter, the researcher highlights all the broad areas which were covered. These include reviews of past studies where important contributors to the issues related to the study have been referenced. The chapter starts examining three most relevant theories on RL and finally reviews the empirical literature hitherto been conducted by various researchers in the past.

6.1 Theoretical Literature

In this section, theories relating reverse logistics and profitability were discussed. This enabled the researcher to have a more informed approach to the study. In particular, the researcher looked into the theories waste management and Minimisation. Three theories explain the development and application of the RL strategy in organizations.

6.1.1 Resource Based Theory

Resource-based theory originated from the work of Wernerfelt, (1984), in which he argued that a firm's strategic resources differences are laxly related to differences in product or service attributes, and thus, to competitive advantages and differences in performance. This view was reinforced by Srivastava, (1994). As earlier defined, RL involves wide stages of processes, which include product returns, source reduction, recycling, materials substitution, reuse of materials, waste disposal, and refurbishing, repair, and remanufacturing (Stock, 1998), which are all needed some level of resource commitment. Firm resources can be tangible or intangible, and may be developed inside the firm or acquired in the market (Hall, 1992). Resource commitment includes the allocation of tangible and intangible entities available to the companies that enable it to produce efficiently and/or effectively a market offering that has value for some market segment (Hunt, 2000).

The RBV theory of the firm argues that a firm can be regarded as a bundle of resources, and resources that are valuable, rare, imperfectly imitable and substitutable are a firm's main source of competitive advantage (Amit&Schoemaker, 1993; Barney, 1991; Peteraf, 1993; Wernerfeldt, 1984). According to Barney (1991), the concept of resources includes all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable it to conceive and implement strategies that improve its efficiency and effectiveness. If these conditions hold, the bundle of resources can sustain the firm's aboveaverage returns. Resources are the inputs or the factors available to a company which helps to perform its operations or carry out its activities (Black &Boal 1994, Grant (1995). Norek (2002) noted that returns management may be the most neglected part of supply chain practices. However, a well-designed RL program can unbundle these resources.

The same authors opine that resources, if considered as isolated factors do not result in productivity; hence, coordination of resources is important. Productive activity requires the cooperation and coordination of teams of resources. A capability is the capacity for a team of resources to perform some task or activity. (Grant, 2010) Hence, the presence of capability enables resources to begin to be utilized, and the potential for the creation of output arises. While resources are the source of a firm's capabilities, capabilities are the main source of its competitive advantage (Schmidt &Keil 2013).

This theory provides KP with a better understanding of its resource base which lies with effective RL strategy. Already scrap metal has become a very valuable resource. Materials such as transformer oil, rotten poles, copper windings and the like are rare in the Kenyan market. They too cannot be imitated nor substituted, bearing in mind that KP is the single most consumer of the resource. There is urgent need for such resources to be taken care of and protected because doing so can improve organizational performance (Crook et al, 2008).

Although the resource-based view has emerged as one of the substantial theories of strategic management, it is said that it has overlooked the role of entrepreneurial strategies and entrepreneurial abilities as one of the crucial sources of the competitive advantage of a firm (Akio, 2005). Therefore it is open to criticism that the RBV contains a theory of sustainability but not a theory of competitive advantage (Priem& Butler, 2001). Secondly, the concept of a 'rare' resource does not necessarily ensure the competitive advantage of the firm, even if that resource generates a large 'rent' due to its relative scarcity. Likewise Schmidt &Keil (2013) have also discredited the RBV for assuming that the resources are available to one firm only and that the customers have an infinity demand for them while in reality, efforts to reduce costs have a decreasing marginal effect.

6.1.2 Product Life Cycle Theory

The product life cycle (PLC) theory, developed by Vernon (1966) and his associates-particularly Wells (1968) has become one of the leading explanations of international trade patterns in the marketing literature. The theory

postulates that all products follow a similar pattern over time of development, birth, growth, maturity and decline as shown in figure1. It explains how and at what stage firms move their products and innovations through markets and also shows the sales of a product over time. Each of the stages is characterized by its own distinct marketing opportunities and restraints.

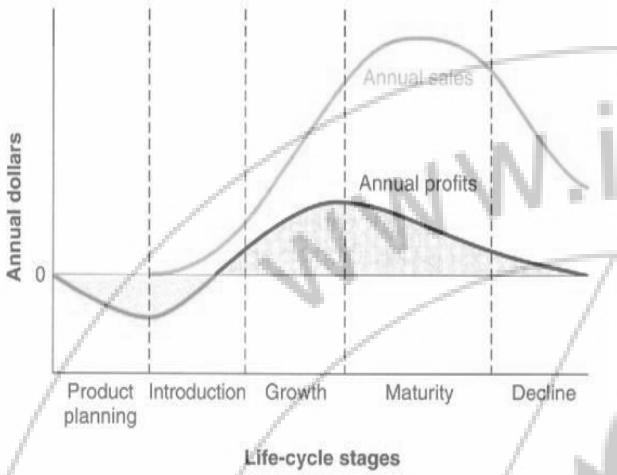

Figure 2: Product Life Cycle
Source: Easton F. (2005)

It the second stage a new and previously unknown product is introduced to buyers. This stage of the cycle could be the most expensive for a company launching a new product. Sales are small, the production process is new, and cost reductions through economies of size or the experience curve have not been realized. The promotion plan is geared to acquainting buyers with the product. The pricing plan is focused on first-time buyers and enticing them to try the product. This is followed by the stage where sales grow rapidly. Buyers have become acquainted with the product and are willing to buy it. So, new buyers enter the market and previous buyers come back as repeat buyers.

Production may need to be ramped up quickly and may require a large infusion of capital and expertise into the business. Cost reductions occur as the business moves down the experience curve and economies of size are realized. Profit margins are often large. Competitors may enter the market but little rivalry exists because the market is growing rapidly. Promotion and pricing strategies are revised to take advantage of the growing industry. At the maturity stage the market becomes saturated. Production has caught up with demand and demand growth slows down. Majority buyers are repeat buyers although here are few first-time buyers. Competition becomes intense, leading to aggressive promotional and pricing programs to capture market share from competitors or just to maintain market share (Kotler 2012). Intense pricing programs often lead to smaller profit margins. Although companies try to differentiate their products, the products actually become more standardized. The company also needs to consider any product modifications or improvements to the production process which might give them a competitive advantage.

The most relevant stage in the study is the decline stage. This occurs when the product peaks in the maturity stage and then begins a downward slide in sales. The product becomes obsolete and its technology is old fashioned. There is less interest in the product. Eventually, revenues will drop to the point where it is no longer economically feasible to continue making the product. Investment is minimized or withdrawn all together. The product can simply be discontinued, or it can be sold to another company, (Aswathappa, 2010). Under the scenario, the product is discontinued and stock is allowed to dwindle to zero, but the company may sell the rights to supporting the product to another company, which then becomes responsible for servicing and maintaining the product or opt to dispose of the remains through RL. The PLC theory assists organizations in managing their marketing mix at different stages of the product as well as a foresight on where the product is at a particular time and its production status. In addition, it cautions on careful budgeting to avoid overspending. Life cycles of many products, especially in the electronics and high technology industry have reduced drastically. This has led to advanced supply chains to move product out to customers with minimal stock, because obsolescence rates are high and the value of finished goods inventory declines very fast. While the PLC theory is widely accepted, it does have critics who say that the theory has so many exceptions and so few rules that it is meaningless. Among the holes in the theory that these critics highlight include the following;The length of the phases of the life cycle cannot easily be predicted. They usually vary from one product to another, and this means the marketing mix needs to be altered at different times, (Shelby, 2002). Some products have been seen to go from maturity back to a period of rapid growth thanks to some improvement or re-design or remanufacturing. Some critics argue that by saying in advance that a product must reach the end of life stage, it becomes a self-fulfilling prophecy that companies subscribe to. It is not true therefore to conclude that all products have a RL cycle. According to the theory an assumption may lead to some businesses interpreting the first downturn in sales to mean that a product has reached decline and should be killed, thus terminating some still-viable products prematurely. The theory further suggests an over-emphasis on new product releases at the expense of mature products, when in fact the greater profits could possibly be derived from the mature product if a little work was done on revamping the product. The theory does not adequately account for either product redesign and/or re-manufacturing or recognize the importance of technology and expertise in the area of marketing management (Cool & Goddard, 2006). Not all products undergo the cycle as given. Commodities such as tea, coffee and maize may not exhibit the PLC stages. The same applies to utilities such as water and electricity.

6.1.3 Transaction Cost Economics Theory

Transaction cost theory (TCE) tries to explain why companies exist, and why companies expand or source out activities to the external environment. Ronald Coase set out his TCE theory of the firm in 1937, making it one of the first attempts to define the firm theoretically in relation to the market. The theory regards firms as governance structures rather than production functions (Williamson, 1985). The theory concentrates on the relative efficiency of

different exchange processes within a firm. As a production function, the internalization of one or more stages of production is likely to generate technological economies of scale. As a governance structure, it could lead also to transactional economies when reduced amounts of resources are required to get the intermediate inputs.

Transaction costs could be defined as the costs of acquiring and handling the information about the quality of inputs, the relevant prices, the supplier's reputation, and so on. Brousseau, & Fares, (2000) have classified them into three: Search and information costs, Bargaining costs and Policing and enforcement costs. Search and information costs are those incurred in determining that the required good is available on the market, which has the lowest price, etc. Bargaining costs are the costs required to come to an acceptable agreement with the other party to the transaction, drawing up an appropriate contract and so on. Policing and enforcement costs are the costs of making sure the other party sticks to the terms of the contract, and taking appropriate action in case of breach. The latter is the most relevant in the study. In modern economies, transaction costs have become more important than production costs. Following the TCE theory, firms evaluate the relative costs of alternative governance for managing transactions. Policing and enforcement of RL strategies is costly: they have to be borne in order to enforce the contracts. Firms emerge as a way of economizing on transaction costs in a world of uncertainty, where participating in a market is expensive. Firms have to make decisions whether to engage RL or not or outsource it altogether based on relative costs (Milgrom& Roberts 1992).

Transaction Cost Economics theory has been criticized by Brousseau, E., & Fares, (2000)and Foss & Klein, (2005) for assuming that individual productive capabilities and amenabilities of individuals are unchanged by any transition from one mode to another. This omission leads to a neglect of context-specific processes of individual transformation, development and learning, as well as an overly narrow focus on presumed invariant human attributes such as opportunism (Hodgson, 2009). This theory however is very important in determining a firm's boundary and explaining the efficiency seeking behaviour through constant changes (Williamson, 2002). At KP the TCE theory can be used to understand the policy direction on RL.

6.2 Empirical Literature Review

This chapter presents a review of the past studies having being conducted by previous researchers on each of the study variables and their relationship with the dependent variable.

6.2.1 Contribution of Reverse Logistics to Profitability

Nearly 20 per cent of the organizations in Kenya use their RL capabilities to protect their margins. This strategic usage of RL is closely related to cleaning out the channel. Organizations cleanse their inventories and the inventories of their users utilizing RL processes. Some organizations are proactive in their management of downstream inventory, as opposed to merely being reactive. These organizations have programs in place that maximizes inventory freshness (Rogers et al, 1998).According to Vaidyanathan & Yadong, (2002), properly and thoroughly executed RL programs significantly improve a firm's bottom line performance. The same view is shared by Elmas et al (2011). Indeed, for many firms, the recovery of value from used products provides a good return on investment. For example, producing greener products could lower future liabilities, insurance rates, and customers' disposal costs. By offering "green" products, companies can attract and retain environmentally conscious customers and employees.

Proactive companies could influence the formation of new legislation and avoid taking costly last-minute actions. In addition, information from return analysis can alert companies to product problems or opportunities (Vaidyanathan&Yadong, 2002). Returned merchandise can provide detailed insights about merchandising effectiveness, product performance or deficiencies, consumer expectations and product line and customer profitability. This information is direct feedback from customers and can be used to improve marketing programs, product design, and product buying decisions. Because RL operations and the supply chains they support are significantly more complex than traditional manufacturing supply chains (Meyer, 1999), an organization that succeeds in meeting the challenges presents a formidable advantage that is not easily duplicated by its competitors. Effective RL operations benefit both the organization and its customers. Service management activities, such as repair services, positively impact customers' total cost of ownership (Rogers, 1998), thereby increasing customer loyalty. Consequently, the organization benefits because it has the opportunity to realize additional profit streams from after sale services as well as repeat purchases from loyal customers.

6.2.2 The cost of Reverse Logistics

The primary driver of RL is the staggering cost of returns. For instance, in 2011/2012 financial year, the total revenue from scrap at KP amounted to over 300 million. RL is becoming an important aspect of supply chain management. Third parties specializing in returns have seen demand for their services greatly increased. (Arun et al, 2003). Although many organizations may place more emphasis on procurement logistics, other major corporations understand the vital importance of after-sales logistics to their supply chain.A conservative estimate is that RL accounts for a significant portion of Kenyan logistics costs. Logistics costs are estimated to account for approximately 5% per cent of the Kenyan economy. However, the exact amount of RL activity is difficult to determine because most organizations do not know how large these are. It is estimated that RL costs accounts for approximately five per cent of the total logistics costs in the organization included in this research. According to Stock et al (2002), RL costs are as high as 4 per cent of total logistics costs, which amounts to an estimated $35 billion in 2001 for the US alone. If the reverse process consumes more resources than expected, the process can diminish any benefits otherwise realized via RL. Often times, items traveling through the RL pipeline

must be expedited, such as when a customer has an unserviceable asset and requires immediate replacement or repair or an incorrect order was received. This can lead to increased shipping, transportation, and handling costs for the RL process owner Huscroft et al (2013).

Rodgers & Tibben-Lembke (1998) reports that transaction costs occur around the time of the actual purchase. Some of the major components include: price, order placement/preparation, delivery/transportation tariffs/duties, billing/payment, and inspection, return of parts, follow-up and correction. If a supplier has an RL system in place, it may have a benefit to the customer in terms of lower prices, especially if the customer is willing to consider the option of reconditioned or remanufactured products, which are typically priced significantly cheaper than new products. The downside to a completely centralized system of RL is that handling and transportation costs can increase because all products must be transported from the retail locations to the centralized facility. If a product is going to be thrown away, transporting it to a centralized facility just to throw it away increases costs, but does not increase revenues, because the product is still thrown away. However, the cost savings, reduced disposition time, and improved revenues associated with the implementation of CRCs more than make up for transportation costs incurred if the product is to be scrapped. The cost of returning products to the supplier has led to the development of "zero returns" policies. Under these policies, no products ever go back to the original supplier. The vendor gives the retailer a credit for a fixed percentage of products to be returned. Regardless of the percentage the retailer actually would like to return, the credit will remain the same. Instead of returning the products to the vendor, the products are either destroyed or donated to charity (Rogers et al, 1999). Cost reductions can come from the reduced cost of goods sold and lower operating expenses. Many products and parts can be easily reclaimed. While the reclamation process may incur additional costs, every product or component that can be reinserted into the forward supply chain for sale is one less unit that must be procured or manufactured. Effective returns management and processing can also re duce the costs of environmental compliance or waste disposal.

The reasons for return can range from shipping the wrong product or quantity, goods damaged in shipping, receiving and repairing products for re-sale, or environmental issues (Autry, Richey et al. 2005). A key factor firms need to focus resources on the RL process is that it can have a dramatic monetary impact on the bottom line of the organization. Richey has estimated that approximately 4.5% of all logistics costs within the United States stem from RL activities. On the other hand, RL Association estimates the volume of returns annually at between $150 and $200 billion at cost in the US.Firms realize that the reverse channel is a target for gains in efficiency and reduction of costs. Businesses have started to focus on the reverse channel and started operating it as a value added center and using their reverse process as a differentiator (Stock 2002). This differentiation should allow them to gain/maintain market share, add revenue, and possibly reduce transportation and inventory costs through the continual monitoring and gained efficiencies of their RL process (Daugherty et al. 2002).

6.2.3 Drivers of Reverse Logistics

According to Carter &Ellram (1998) several drivers and constraints determine a company's RL activities. Based on a literature study, they identify regulation and customer preferences as major stimulating factors.The drivers of RL policies and practices will differ among organizations, in large part depending on the perceived importance of this activity to the business. In many organizations, RL still is not considered very important though this is changing. In some organizations, in fact, it is actually viewed as an embarrassment. This could be the case, for example, where the procurement staff responsible for buying product that was not used, are in charge of managing those returns. Often, they resist taking the hit of unused and obsolete products. It is commonly assumed that writing down the book value of the slow-moving inventory and moving it to the secondary market is an admission that the purchase was unsuccessful and so most organizations tend to postpone the decision. The products in question end up losing much more of their value than if the decision to liquidate the inventory was made more quickly. De Brito et al (2003) have classified the drivers of RL into three main groups; Economics, Legislation and Corporate Citizenship. The economic drivers include direct and indirect profits related to reduced production costs, green image, market protection and improved customer/supplier relations.

In addition to corporate perceptions, product attributes are a major driver of RL. The first, and often most important attribute, is the quality of the product being returned. Items that appear to be first quality are more likely to be worth saving that those that are not (Rogers et al, 2013). Product size is another attribute that typically determines how return product is handled. It doesn't make sense to pay high-cost transportation to return a damaged item that is cumbersome to handle. It's wasteful to transport a large item 1,000 kilometers and then throw it away, whatever the prevailing fuel costs may be. Therefore, many organisations have implemented RL procedures in order to adhere to the legal obligations rather than to adopt a proactive performance. The position in the PLC is another attribute that drives returns management strategy and tactics and the patterns associated with it such as pricing, promotion, volumes, profit and cash flow. Disposition of a mature product that is nearing the end of its lifecycle will likely differ from that of successful new product introduction. Another important attribute is price point. If the product is low cost, then a lengthy decision process around its disposition is counterproductive. Another driver of RL is what Rogers, (2013) calls the company's "go-to-market" strategy. This usually relates to the channels the company uses to connect with its customers. It also incorporates supply chain and marketing processes that guide how the company interacts with customers. Some go-to-market strategies will dictate how the firm should handle product returns. For example, it could be that market cannibalization is a major concern. In such cases, the final product disposition would have to be routed to a distant secondary market offshore, thereby alleviating that concern. Finally, there are the financial

drivers that come into play. A major one is inventory turnover. Companies make an investment in inventory and once that inventory is used, it moves into the COGS category. When items are returned, they enter back into inventory—and the transaction is reversed. This reduces the value of the inventory turnover, which is typically used by management as a measure of the health of inventory management within the organization. As is the case with forward logistics, financial flows typically determine the structure of the RL flow. One recurring problem is that managers are often measured on targets which do not consider the impact of RL (Johnson & Templar, 2009).

Companies which excel in handling RL can benefit from financial opportunities. For instance, recovery is often cheaper than building or buying new or raw materials. Recoverable manufacturing systems are environmentally friendly and profitable in a number of industries, including copiers, automobile parts, computers, office furniture, mass transit, aviation equipment and tires (Jayaraman& Dekker, 2005). Recoverable manufacturing operations account for total sales in excess of $53 billion per year, and a survey by Lund (1996) estimates that there are 73,000 firms in the United States engaged in some form of recoverable manufacturing. Efficient returns handling leads to reduced costs, increased profits, and improved customer service. Generally, the financial opportunities of RL can be demonstrated in several ways (Mollenkopf&Closs, 2005). Increased revenues can be realized from reducing discounting levels by offering fresh stock in place of unsold or slow selling stock. Companies can avoid markdowns on older products by managing inventories to keep "fresh" products at the point of sale. New stock attracts higher prices than old stock; the goodwill earned from acting in a socially or environmentally responsible manner can produce real value. Customers respond to companies' behavior, and the goodwill developed through RL and proper disposal of products can create loyalty. For example, Nike takes back used running shoes and converts them into public basketball courts and running tracks as part of its community action efforts. The returns program at Nike is costly to manage, but the company believes their actions enhances the value of their brands and creates loyal customers.

Most retailers and manufacturers have liberalized their returns policies over the last few years because of competitive pressures. Although the trend toward liberalizing returns policies has lessened, firms still believe that a satisfied customer is their most important asset. Part of a customer's satisfaction may involve taking back unwanted products. Generally, customers who believe that an item does not meet their needs will return it, whether or not it functions properly. In the face of competition, a company such as International Business Machines (IBM) started engaging in product recovery to prevent other companies or brokers to access their technology and their market. Recovery can also be a part of an image-building operation or can be used to improve the relationship with a customer or a supplier (Fleischmann et al., 2003). Extended producer responsibility has become a key element of public environmental policy in several countries where manufacturers are obliged to take back and recover their products after use in order to reduce volumes of waste. Return of used products and recovery is an important element for building up a green profile. The EPA cites remanufacturing as an integral foundation of reuse activities and reports that less energy is used and less waste is produced with these types of activities (U.S. EPA, 1997). Some firms use their RL capabilities to portray good corporate citizenship. Philanthropic and goodwill returns can improve a corporate image and increase market share. For example, Hanna Andersson, a $50 million direct retailer of infants' and toddlers' clothes, developed a program called Hannadowns. In Hannadowns, customers are asked to mail back their children's worn Hanna Andersson clothes which are then distributed to schools, homeless shelters, and other charities. The company then gives those customers 20% off the purchase price of new Hanna Andersson clothes (Vaidyanathan&Yadong, 2002).

6.2.4 Strategies to minimize waste

Comparatively, public organizations have higher return rates than most other industries. It is not unusual for a parastatal to have return rates above 10 per cent. The mean level is approximately 5 per cent. These public organizations have had to improve their management of the return process. Most public organizations have developed returns programs internally. They utilize their RL capabilities strategically. Because return rates for many of the parastatals have traditionally been high, a reduction in both the number of returns and the cost of those returns is needed. In their study, Rogers &Tibben-Lembke, (1999) have classified returns into the following categories: surplus, obsolete, scrap, waste and excess material products, and other assets. They propose for asset recovery strategy. In a way that maximizes returns to the organisation, while minimizing costs and liabilities associated with the dispositions. The objective of asset recovery is to recover as much of the economic (and ecological) value as reasonably possible, thereby reducing the ultimate quantities of waste. Asset recovery has become an important business activity for many organizations. This depends on the ability of that organisation to recover as much economic value as possible from used products, while minimizing negative impacts to the environment.

The attitude of many organizations towards used products has been to ignore them, and avoid dealing with them after they are originally issued. Most manufacturers in Kenya are not responsible for products after they are sold. Most products are designed to minimize materials, assembly, and distribution costs, and ignore the repair, reuse, and disposal requirements. Manufacturers have generally believed that the costs of incorporating these requirements would outweigh the benefits. According to Dawe, (1995) of the Fritz Institute of International Logistics there are six symptoms of problem returns: If a large amount of returns inventory is being held in the warehouse, clearly there is a problem with the way the organisation is handling returns. If a large number of unauthorized or unidentified items are being discovered, again, there must be a significant problem with the return process. Piles of unprocessed returns are easy to observe. Unfortunately, some of these other symptoms Dawe identified are not as easily observed. This research will confirm if shortening returns processing time

is important for handling returns well. If organizations do not monitor the length of their processing cycle times, they have no way to determine how well they are doing in this area.

According to Rogers (1998), CRCs are processing facilities devoted to handling returns quickly and efficiently. CRCs have been utilized for many years, but in the last few years, they have become much more popular as more organisation and manufacturers have decided to devote specialized buildings and workforces to managing and processing returns. In a centralized system, all products for the RL pipeline are brought to a central facility, where they are sorted, processed, and then shipped to their next destinations. This system has the benefit of creating the largest possible volumes for each of the RL flow users, which often leads to higher revenues for the returned items. It also allows the organisation to maximize its return on the items, due, in part; to sortation specialists who develop expertise in certain areas and can consistently find the best destination for each product.

The concept of absorbing the risk that a product might be faulty, damaged, or simply unwanted, attracts users, increases sales, and at the same time, causes major problems for organisation. While liberal return policies draw users, they can also encourage user abuse. The stores personnel should never accept any item as returns. However, without good systems in place and well trained personnel at store level, this kind of abuse occurs more often than organisation would like to admit. Organisation need to do better training of their employees. They can also develop systems to take the decisions out of the hands of the user. Nintendo, the electronic game manufacturer, has developed a particularly innovative screening system which, many organisations can borrow a leaf from. Failure in returns gatekeeping can also create significant friction between supplier and organizations, not to mention lost revenue (Rogers et al, 1998).In the last two decades and especially the nineties, there was the emergence of green laws in the European countries. These laws require the manufacturing companies of products to design and manage the ultimate disposal of certain products (Schuh, et al 2011). In addition to that, the emergence of environmental legislations that requires the return and proper disposal of wastes in accordance to the standard rules and regulations makes it possible for the growth of RL. For instance, the European Union Directive points out the basic waste management principles which require green initiatives. It incorporates waste prevention, waste reuse, recycling, recovery and proper disposal (2008/98/EC of the European Parliament and of the Council 2008).E-waste has garnered public attention leading to policies and other efforts aimed at managing reverse supply chains for computers and other electronics. In Europe, the introduction of the Waste Electrical and Electronic Equipment Directive by the EC in 2003 which restricts the use of hazardous substances in electrical and electronic equipment and promotes the collection and recycling of such equipment (Directive 2002/95/EC of the European Parliament, the Council 2003) has given priority and supported the recycling of E-waste and hence reduced on its disposal in the environment. The Netherlands, Norway, Portugal, Sweden, Switzerland, Belgium, Denmark, Italy, Korea, Japan and Taiwan are countries that have already enacted the policy of take back of E-waste; the United States is on the move of enacting the mandate (Williams et al, 2008). Linda, (2007) reports that the development of WIS tool in South Africa has helped and supported the integration and implementation of waste reduction and pollution measures. The WIS acts as a government tool where workshops and information dissemination with key informants on waste issues is held on national level.Financial management issues are the primary determinants in the structure of a RL system, and the manner in which a product is disposed. It follows that accounting problems drive the actions of managers. For example, merchandise designated to go back to the supplier due to overstocks, or because it cannot be used, is earmarked for processing through a centralized return centre. However, internal accounting processes expense those items. A suitable financial policy should be able to penalise the right party for lost value.

Rogers et al, (1998) suggests that issues related to chargeback's and bottom line responsibility for returns must be a key consideration when developing a good RL management system. A related construct from Carter &Ellram'sframework is quality of inputs, which encompasses the purchasing of quality and green materials up front so that there are fewer and less costly returns to manage in the reverse process. This strategy can reduce disposal costs and the quantity of overall returns. In addition, costs can also be affected by uncertainty, as identified within the framework. Generally, organisation policies that pose difficulties are related to accounting issues. Sorting out who should be paid, and who should be penalised can be a challenge. However, returns are often the number one issue in reconciling accounts receivables.

6.2.5 Public Procurement and Disposal Act 2005

In Kenya, unlike private sector business and commercial entities, procurement and purchasing procedures of public sector bodies are governed by Public Procurement and Disposal Act passed in 2005 and new regulations issued in 2007 (Gershon, 2007). Governmental entities have encouraged increased recycling through marketing efforts concentrated on promotional and distribution factors. Governmental entities have encouraged the development of RL channels by developing a system of financial incentives or penalties to increase demand for recyclables. Such strategies aim at the development of more efficient RL channels, with less cost to the government, while also reducing environmental degradation which might occur due to improper disposal of waste.

The PPDA 2005 is the regulatory framework that manages the disposals in Kenya. In the study, the Act is considered as an intervening variable. The Act is an improvement of the 2001 Regulations in a number of respects. In addition to establishing improved public procurement procedures, it provides for disposal of unserviceable, obsolete or surplus stores and equipment by public entities. This act is the foundation of the RL strategy of most public organizations in Kenya. Part X of PPDA 2005 deals with disposal of stores and equipment. The act stipulates the methods

available for public entities in their quest to dispose of stores, assets or equipment.

The DC, appointed by the head of the public entity drives the process. It must justify to the CEO the need for the PE to dispose of the stores, assets or equipment. They may recommend any of the following methods, which are subject to the approval of the CEO: Sale by public auction, transfer to another public body, destruction, dumping or burying, trade in and sale to an employee. The Act provides that no pre-qualification may be conducted for disposing of stores, assets or equipment. Destruction, dumping or burying method of disposal should be subject to the laws pertaining to public health and safety, environmental protection and instructions issued by the PPOA on this method of disposal.

6.2.6 Organizational Policy and Culture

Organizational policy and culture is also treated as an intervening variable in the study. Existing literature on return policies mostly put more attention on the manufacturer-retailer side of the relationship (Andel, 1997; Padmanabhan 1995); recent focus is shifting to the issue of returns in the retailer-consumer relationship. Much of this change is gaining focus from results of the advent of Internet-based retailing within the past decade (Mollenkopf et al., 2007). Retailers find that clearly communicating their returns policy provides a signal to consumers about the more intangible aspects of the product and service quality provided (Kirmani&Rao, 2000), this signal therefore could lead to the increase of customer loyalty (Padmanabhan ,1995). According to Rogers &Tibben-Lembke (1999), the reasons Internet retailer offer return provisions to their customers are varied. They could be a reflection of the e-retailers' desire to become more competitive against rivals' return policies, or it could be the belief that when a customer is satisfied, he will grow to be a valuable asset to the company. From a customer's perspective, online purchase involves a significant level of risk (Yalabik, 2005) especially due to the physical separation of the customer and the product. People tend to avoid making purchase on products they don't have knowledge about, if they can't get the product's attributes or quality information directly, they will be unsure about the purchasing decision. As further noted by Mollenkopf et al. (2007) that only at experiential stage can a consumer determine his or her true preference.

As a result of the customer's perception of potential risk, each purchasing decision an online shopper made would imply the risk he/she would be taking. Given the above discussion, it is reasonable to assert that online consumers expect to receive a liberal returns policy (Kirmani&Rao, 2000; Rogers et al, 1999) as a measure against a negative experience relating to size, color, styling, and product quality (Padmanabhan, 1995). From the former experiences, retailers discover that unmistakably communicating their returns policy provides a signal to customer about the more intangible aspect of the product and service quality provided (Kirmani&Rao, 2000), which is expected to increase satisfaction of the customers. Some organizations have begun to take a more aggressive stance with users by deliberately reducing returns. This can be counterproductive if other organizations operating in the same industry have liberal return policies. If we take into account that many clients could consider the policies implemented by the company regarding returns as an additional feature of the customer service, the above mentioned results pointed to the fact that companies have not yet internalised the advantages they can themselves get from an effective RL implementation.

Some companies still seem to ignore that return policies might result in substantive means of improving the service they offer to their clients, getting in return bigger impact in customer loyalty and, consequently, in sales. Customers expect more from manufacturers, retailers, and service providers in regard to return policies, and companies are seeking to attain as much value out of any returned product (Autry et al. 2001). Customers can return products for any number of reasons and the firm must be prepared to handle and process the return in a timely manner to ensure they are maintaining adequate customer satisfaction levels and increase the likelihood of future transactions (Huscroft, et al 2013). By making it easier for customers to deal with returns, there is often more willingness to complete the initial sale (Daugherty et al, 2002). This link between the implemented return policies and benefits from customers' performance would be enhanced, the more so when a liberal and efficient return policy is backed by good capability of tracking the returned products. This visibility enables for accurate information at any time (e.g. Amazon.com's web-based tracking service). If customers may feel deceived for having got a commodity that must be returned, it will be advisable to avoid deteriorating the relationship even more by not providing good information about the status of the product (Fernandez, 2005).If one player in the industry has a liberal return policy, it is difficult for other organizations in that industry to tighten their return policies. Some organisations are beginning to rethink liberal return policies, and balance their value as a marketing tool against the cost of those policies.

One reason for a generous return policy is that it leads to improved risk sharing between suppliers and users. In some channels, users can return anything to the organisation, the organisation and wholesalers have liberal return arrangements with manufacturers, and manufacturers end up taking responsibility for the entire product life cycle. KP users are much quicker to return goods than those in most other organizations. In fact, in many other state corporations, returns are never allowed for fear of abuse. Part of the difficulty that organizations have in compacting disposition cycle time is that there does not seem to be much reward for taking responsibility and making a timely decision as to how product should be dispositioned. Employees have difficulty making decisions when the decision rules are not clearly stated and exceptions are often made. It is easier to pass the product back to the previous stage in the channel, because that reduces both personal and organisation risk. Another critical element to successful RL management is having short disposition cycle times. The organizations that are best at managing their RL processes are adept at screening, as described above.

These organizations are also able to reduce cycle times related to return product decisions, movement, and processing. Often, when material often comes back in to a distribution centre, it is not clear whether the items are: defective, can be reused or refurbished, or need to be sent to a landfill. Reverse logistics functions are often considered as non-core operations for most organizations, they are not always willing to perform them by themselves. These activities would just represent a deflection of the firm's attention away from its core activities (Serrato et al, 2007). In such circumstances, organisations should consider outsourcing the function to a specialist third party service provider. Often, these outsource suppliers perform reverse activities better, and one may find that by using these services organizations can reduce the administrative hassle of doing it themselves.

7. Research Methodology

The study adopted a descriptive case study research design. The target population of the study comprised of the employees working at the supply chain department of Kenya Power Ltd who were a total of 156 employees.The study employed a probabilistic sample through cluster sampling technique on its sample size, since the population of interest was found in five different geographical regions of KP and is thus heterogeneous. Employing this technique enabled us to derive a more representative and accurate sample of the various sub-populations. Since the target population N is known, the study adopted the formula of Israel, (1992) as shown in the equation 1, to determine the sample size, n, of case study respondents

$$n = \frac{N}{1 + Ne^2}$$

where n is the optimum sample size, N the target population (i.e. the total number of employees) in Kenya Power, Supply Chain Division, e the probability of error(i.e. the desired precision e.g. 0.05 for 95% confidence level.) n was approximately 112 as derived in the equation 2 below:

$$n = \frac{156}{1 + 156(0.05)^2} = \frac{156}{1.39} = 112$$

Using proportionate sampling, the sample size consequently comprised 112 employees. The actual respondents were determined using a simple random sampling technique.

Table 1: Sample Size

Region	*Population*	*Percentage*	*Sample Size*
Central Office	52	33%	37
Nairobi Region	35	22%	25
Coast Region	12	8%	9
Mount Kenya Region	23	15%	17
West Region	34	22%	24
Total	156	100%	112

A structured questionnaire containing a mix of questions, allowing for both open-ended and specific responses, some on a 5 point Likert scale, was the preferred instrument for the study .This is because respondents of the study were assumed to be literate and quite able to answer questions asked adequately. For top management, an interview schedule was used because they were thought to be too busy to fill in the questionnaires. The interview schedule was used to particularly tackle the first objective. Piloting of the instruments was done to test the appropriateness of the instruments and to enhance the reliability and validity of the instruments. Validity of the research instruments was ensured through content analysis and consultations as well as expert judgment at every stage. Half split method was used in testing for reliability whereby a group of 12 staffs (6 males and 6 females) from Supply Chain division, but who did not eventually feature in the final response, were approached for the pilot test. The pilot questionnaires were then analyzed using the Cronbach Reliability coefficient. Data was collected by research assistants using self-administered questionnaires while the interview schedule was administered to 3 top managers in the supply chain division.

7.1 Data Processing and Analysis

Data was analyzed by help of Statistical Package for Social Sciences (SPSS Version 20) and the results presented in tables in the form of measures of central tendency such as mean, variation such standard deviation for better understanding. In order to establish the link between RL and organizational profitability, the study also employed the use of inferential statistics since the sample although accurate, was not a perfect representative of the population and so generalizations did not suffice. Parametric tests such as Karl Pearson's coefficient of correlation were used to test the null hypotheses, and to determine the relationships among the variables under study.

7.2 Research Findings

The analysis was based on all the questionnaires that were issued to the respondents and returned on time. Out of the 112 questionnaires that were issued 102 were returned which represented a 91% response rate. All the questionnaires were fully and correctly filled and the three managers were interviewed as planned. The high return rate was achieved due to a suitable strategy employed. Name of all employees who received the questionnaires were recorded and telephone follow ups done to ensure each questionnaire was returned. Of the 10 which were not returned, 2 were returned late and thus were not included in the analysis.

7.2.1 Contributions of Reverse Logistics to Profitability

The study sought to find out the contributions of RL on profitability at KP. To obtain accurate and reliable information on these variables, the researcher used interview schedule which was conducted on three managers at Supply Chain Division, namely the General Manager, Supply Chain Division, Manager, Procurement and Manager, Logistics. The responses formed the basis for making conclusions on the contributions of RL on

profitability. Consequently, the hypothesis on the objective was analyzed based on the response.

The managers were interviewed on whether RL is applied in their division; they all agreed that RL was applied in their division. The researcher also sought to find out the total estimated value of scrap that was held in the company. There were varied responses as scrap value was estimated at 20 million, 500 million and 10 million respectively. A mean of 175 million represented the potential value of returns at KP. The key source of scrap was reported to be steel metal, copper conductors, aluminum conductors, scrap metal, transformers and switch gear, cables, scrap poles and furniture. The respondents were also asked to list the benefits of RL initiatives. The opinions on the matter were generally similar. They reported that RL helped in saving space besides freeing capital. It also enabled efficient use of materials and that it reduced overall costs. In addition, it was generally agreed that RL initiatives contributed to additional revenue for the company, improved working environment and enhanced the company image through disposal and cleaning. The contribution of RL was also measured in terms of its portion on the gross profit. The profit percentage was estimated at 0.5%, 10 % and 5% respectively**.** This showed that RL contributed an average of 5% of the profitability of KP.

The realized value of disposals at KP was estimated over duration of three years by the respondents. Product returns were valued at 60 million for the calendar year 2012, 100 million for the years 2013 and 150 million for the year 2014. Further, the findings showed that RL at KP did not involve the return of packaging materials. On the other hand, revenue from disposal showed growth over the years and was valued at 100 million for 2012, 400 million for 2013 and 450 million for the year 2014.Considering the contributions of RL to profitability at KP, the researcher sought to establish whether there were plans to outsource RL activities. All respondents unanimously reported that there are plans to outsource RL activities. In attempts to recoup value from returns through RL, the findings revealed that KP faced a myriad of challenges in the management of RL. Among the major challenges which were reported by the managers included legislation, (PPDA, 2005) which was regarded as tedious and long. Consequently, it was reported that vandalism was rife and that company stock was exposed to theft by servant in conjunction with scrap dealers. Respondents revealed that bidders often delayed in collecting items within stipulated time besides irregular disposals by the Company. It was also established that among other challenges, there was lack of timely communication, poor planning and lack of knowledge and appreciation of users. Based on the findings as discussed above, the null hypothesis was rejected that RL does not significantly contribute to profitability.

7.2.2 The cost of Reverse Logistics

The second objective of the study was to assess the relationship between cost of RL and profitability of KP. The results are tabulated below;

Table 2: The Percentage Cost of Reverse Logistics

No.	*Variables*	*N*	*Min*	*Max*	*Mean*	*Std. Dev*
1	Transaction costs	102	10	96.5	58.1	1.93
2	Transportation costs	102	5.0	80.0	26.3	1.67
3	Reclamation costs	102	0.0	40.0	7.9	0.70
4	Disposal cost	102	0.3	54.5	9.6	0.93

Findings were first structured to present the range of costs relating to the total life costing (TLC) as perceived by the respondents. Besides, the researcher also focused on finding out the exact value of RL activities at KP. To achieve this objective, the respondents were asked to estimate the four main costs of ownership namely, transaction, transport, reclamation and disposal costs. The values provided by the respondents for various costs involved in the TLC were averaged to find the mean of each cost. It was revealed that at 58%, transaction cost was the major component TLC at KP. Secondly, transport cost was averaged at 26% of TLC. The total cost of RL was obtained by the summation of both the reclamation and disposal costs, which were found to represent 7.9% and 9.6% of TLC. These two costs amounted to 17.5%, which was established to be the cost of RL at KP. Based on this percentage, the null hypothesis was rejected that RL cost has no significant impact on profitability at KP.

7.2.3 Drivers of Reverse Logistics

The study sought to find the drivers of RL at KP and how they influenced profitability. The findings presented the motive behind returns by users and preferred methods of disposing returns at KP as follows;

Table 3: Reasons for Reverse Logistics

No.	*Variables*	*N*	*Min*	*Max*	*Mean*	*Std. Dev*
1	So that goods can be reworked	102	1	5	4.05	0.974
2	If there is material surplus	102	1	5	4.42	0.823
3	Poor quality goods are issued	102	1	5	4.30	0.924
4	Production left over	102	1	5	3.81	1.249
5	Liberal return policies	102	1	5	3.21	1.308
6	Obsolete products	102	1	5	4.02	0.879
7	Recall by Kenya Power	102	1	5	3.42	1.238
8	To adjust stock	102	1	5	3.76	1.314
9	Equipment due for repairs	102	1	5	4.30	0.924
10	To claim warranty	102	1	5	3.49	1.069
11	End of life	102	1	5	3.88	1.366
12	Products with short life cycles	102	1	5	3.53	1.022

Table 3 indicates that the pre-dominant opinion was that the major reason for RL was material surplus as evidenced by the mean of 4.42. Respondents also agreed (mean =4.30) that RL at KP was driven by the need for repairs and that poor quality goods were often issued. It was also agreed (mean =4.05) that reverse logistics was undertaken so that goods could be re-worked. In addition, where products were obsolete, respondents agreed (mean=4.02) that RL was necessary. Further, other reasons for RL were agreed upon

by some respondents including production left over (mean=3.81), to adjust stock (mean=3.76), end of product life (mean=3.88) and due to products with short life cycle which was indicated by a mean of 3.53. Respondents were asked whether RL at KP was due to a liberal return policy, recalls or need to claim warranty. The findings indicated that respondents were not sure on the variables as shown by the means of 3.21, 3.42 and 3.49 respectively. Respondents were also asked to choose the most applied method of disposal from the list of 9 recommended methods as per (PPDA, 2005) provided.

Table 4: Disposal Methods Kenya Power

No.	*Variables*	*N*	*Min*	*Max.*	*Mean*	*Std. Dev.*
1	Re-use/ recycle	102	1	5	2.55	1.310
2	Salvage/ cannibalize	102	1	5	2.78	1.174
3	Repair/refurbish	102	1	5	3.33	1.197
4	Sale by open tender	102	1	5	4.42	0.814
5	Public auction	102	1	5	4.80	0.747
6	Transfer to another public entity/donation	102	1	5	2.03	1.173
7	Destruction, dumping or burying	102	1	5	2.19	1.288
8	Trade in	102	1	4	1.71	1.020
9	Disposal to public servants	102	1	5	2.47	1.494

The findings above indicated that the most preferred method of disposing returns at KP was by public auction, this was noted by majority of the respondents who agreed (mean=4.80) on the matter. Another significant section of the respondents agreed (mean=4.42) that disposal of returns was usually done through sale by open tender. The study also revealed that the bulk of the respondents were uncertain whether returns at KP were disposed through re-use, salvage or repair. These findings were indicated by means of 2.55, 2.78 and 3.33 in that order. In addition, respondents disagreed (mean=2.03) that returns at KP were disposed through transfer to another public entity or through donation. Further, when asked whether disposal of returns was done through destruction or disposal to public servants, respondents disagreed (mean=2.19 and mean=2.47) as shown in table 4 above. Consequently, respondents strongly disagreed (mean=1.71) that disposal of returns at KP was conducted through trade in.

Respondents were asked to indicate the extent to which they agreed or disagreed to various statements about the status of RL at KP. Their responses were as follows.

Table 5: Status of Reverse Logistics at Kenya Power

No.	*Variables*	*N*	*Min.*	*Max*	*Mean*	*Std. Deviation*
1	RL aims at enhancing profitability	102	1	5	3.76	1.101
2	KP has effective RL strategies	102	1	5	3.25	1.147
3	RL is a competitive strategy at KP	102	1	5	2.90	1.165
4	RL benefits both organization and customer	102	1	5	4.15	0.999
5	There is accurate information on state and value of disposals	102	1	5	3.44	1.068
6	Adequate training is provided towards successful implementation of RL strategies	102	1	5	2.70	1.273
7	KP allocates adequate resources for implementation of RL strategy	102	1	5	2.96	1.202
8	Transportation cost a major barrier to RL	102	1	5	2.98	1.266
9	RL reduces overall cost of inventory	102	1	5	3.84	1.041
10	KP management recognition of RL contribution to profitability.	102	1	5	3.23	1.266
11	Awareness of KP returns policy among employees and customers.	102	1	5	2.73	1.153
12	Preparedness of KP transport facilities to evacuate returns.	102	1	5	2.84	1.041
13	KP has elaborate and effective systems to manage waste	102	1	5	2.86	1.178
14	KP compliance with NEMA regulations in waste management	102	1	5	3.61	1.045
15	Used products are ignored at KP	102	1	5	2.82	1.246
16	Cost of using greener products outweighs benefits	102	1	5	2.96	1.250
	Valid N (list wise)	102				

According to table 5, a greater number of the respondents agreed (mean=4.15) that RL at KP benefits both the organization and its customers. It was also agreed upon (mean=3.76) that RL at KP was aimed at enhancing profitability. In addition, it was also agreed upon (mean=3.84) that RL reduced overall cost of inventory at the Company. Besides, another significant section of respondents agreed (mean=3.61) that RL at KP was conducted in a manner that complied with NEMA regulations in waste management.

On the other hand, respondents were not sure whether RL was used as a competitive strategy, whether there was training towards implementation of RL, whether transportation cost was a major barrier, whether there were adequate resources for implementation, whether RL was recognized by the management of KP and whether employees at KP were aware of return policy as shown in table 4.7 above. Lastly, as indicated by the mean of 2.84, 2.86, 2.82, and 2.96, respondents were uncertain whether KP transport facilities were well prepared to evacuate returns, elaborate and effective systems to manage waste

existed, whether used products are ignored and whether cost of using greener products outweighs benefits.

7.2.4 Strategies of minimizing waste

The research study aimed at finding out the major strategies used by KP to minimize waste. Respondents were asked to agree or disagree on the major objectives of RL strategies and to rate various RL strategies at KP as regards waste minimization. The findings were as follows;

Table 6: Objectives of Reverse Logistics Strategies

No.	Variables	N	Min.	Max.	Mean	Std. Deviation
1	Improves asset utilization	102	2	5	4.27	0.785
2	Has legal implication to KP	102	1	5	3.74	0.911
3	Reduces cost of operations	102	1	5	3.94	0.993
4	Improves customer satisfaction	102	1	5	3.77	0.984
5	Has potential profit source	102	2	5	4.09	0.797
6	Protect market and brand	102	1	5	3.74	0.878
7	Complies with environmental legislation	102	2	5	3.96	0.878
8	Promotes corporate citizenship	102	2	5	3.92	0.972
	Valid N (list wise)	102				

Table 6 shows that the major objective of RL at KP was to improve on asset utilization. This was revealed by the majority of the respondents who agreed (mean=4.27) on the issue. It was also agreed (mean=4.09) that RL at KP was necessary because it has potential profit source to the company. Another objective of RL was to comply with the environmental legislation as was agreed (mean=3.96) upon by respondents. Further, RL strategies at KP were aimed at reducing cost of operations. This was reported by many respondents who agreed (mean=3.94) on the issue. The results on Table 4.8 further disclosed that respondents agreed that RL is aimed at promoting corporate citizenship (mean of 3.92), improving customer satisfaction (mean= 3.77), and to protect market brand (mean=3.74).

The researcher sought to find out the most conspicuous waste management strategies and whether users were aware of these strategies. The findings were as per table 7 below:

Table 7: The Ranking of Waste Management Strategies at Kenya Power

No.	Variables	N	Min.	Max.	Mean	Std. Dev.
1	Attempts to recover value	102	1	5	3.88	1.027
2	Return policies at KP are liberal	102	1	5	3.25	1.009
3	IT & T systems are used in management of RL	102	1	5	3.36	1.159
4	RL is used to improve customer satisfaction	102	1	5	3.29	1.086
5	KP uses RL to differentiate itself	102	1	5	2.38	1.117
6	Use of centralized return centers for disposals	102	1	5	3.56	1.131
7	KP reducing return processing cycle time	102	1	5	3.04	1.107
8	Finance provisions for risks associated with returns	102	1	5	3.17	1.144
9	Purchase of greener products by KP	102	1	5	2.96	1.414
10	KP imposes penalties on lost value	102	1	5	2.99	1.270
	Valid N (list wise)	102				

The most important waste management strategy at KP was recorded as attempts to recover value. This was reported by the bulk of the respondents who agreed (mean=3.88) on the matter. A sizeable number of the respondents agreed (mean=3.56) that use of centralized return centers for disposals was also an important waste management strategy at KP. From these finding, the null hypothesis was accepted that available strategies will minimize waste at KP. On the other hand, respondents were not sure on other waste management strategies including; whether return policies at KP are liberal (mean=3.25), IT and T systems are used in management of RL (mean=3.36), RL is used to improve customer satisfaction (mean=3.29), KP reducing return processing cycle time (mean=3.04), Finance provisions for risks associated with returns (mean=3.17), Purchase of greener products by KP (mean=2.96) and KP imposes policies on lost value (mean=2.99). Finally, it was disagreed (mean=2.38) that dealing with waste was not used by KP as a strategy to differentiate itself as reported by majority of the respondents.

7.3 Hypothesis Tests Results

Inferential statistics were used to try to drawing conclusions from data that was subject to random variation. Two tests were adopted: Z-Test and Pearson Correlation as shown.

7.3.1 The Cost of Reverse Logistics on Profitability at Kenya Power

The Null Hypothesis for this objective was that the cost of reverse logistics has no significant impact on profitability at Kenya Power. At 0.05% confidence level, Z-test was applied to form the basis to reject or accept the null hypothesis. The results showed that Z-calculated was greater than the table value i.e. 7.09>1.96. Since Z calculated is greater than Table value, the Ho was rejected that cost of reverse logistics has no significant impact on profitability at Kenya Power. This led to the conclusion that the cost of reverse logistics has significant impact on profitability at Kenya Power.

7.3.2 Drivers of Reverse Logistics and Profitability

The study sought to establish the relationship between the drivers of RL and profitability at KP. The H_o for objective three was that there is no significant relationship between drivers of reverse logistics and profitability at Kenya Power .The results showed that the p (.000) value was below .05 thus the null hypotheses was rejected and accepted that there is a significant relationship between drivers of RL and profitability. The two variables were correlated as shown;

Table 8: Drivers of Reverse Logistics and Profitability

		Drivers of RL	Profitability
Drivers of RL	Pearson Correlation	1	.367**
	Sig. (2-tailed)		.000
	N	102	102
Profitability	Pearson Correlation	.367**	1
	Sig. (2-tailed)	.000	
	N	102	102

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

Table 8 revealed that drivers of RL have an r-value of .367 indicating a significant relationship between the effect of RL drivers and profitability at 90% confidence level. This is satisfactory to the third objective of the study; to evaluate the effect of drivers of RL on profitability at KP. Moreover this relationship is positive. Therefore drivers of RL are positively correlated with profitability at KP.

7.2.5 Relationship between Strategies of Minimizing Waste and Profitability

A similar treatment to one above was administered on the relationship between the various waste minimization strategies and profitability at KP. The null hypothesis for the fourth objective was that aavailable strategies will not minimize waste at Kenya Power. The findings showed a p value of (.002) which was below .05. This led to the rejection of the null hypothesis that available strategies will minimize waste at KP at 5% level of significance. They variables were correlated as shown.

Table 9: The Relationship between Strategies and Profitability

		Waste minimizing Strategies	Profitability
Waste minimizing strategies	Pearson Correlation	1	.302**
	Sig. (2-tailed)		.002
	N	102	102
Profitability	Pearson Correlation	.302**	1
	Sig. (2-tailed)	.002	
	N	102	102
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 9 revealed that waste minimization strategies had an r-value of .302 indicating a significant relationship between waste minimization strategies and profitability. This was satisfactory to the fourth objective of the study. In addition, the relationship between strategies to minimize waste at KP and profitability was positive. Therefore strategies of minimizing wastes at KP are positively correlated with profitability at the Company.

8. Summary, Conclusions and Recommendations

The researcher summarized the findings in line with the variables and objective of the study. This was followed by drawing of relevant conclusions. Lastly, recommendations for pertinent actions were suggested.

8.1 Summary

The study focused on the role of reverse logistics (RL) in the overall profitability of the organization with regard to KP. A descriptive case research design was adopted to establish whether there was a link between RL and profitability. Data was obtained by use of both structured questionnaires and interview schedules targeting employees working in Supply Chain Division of KP whose population was 156. A simple random sample of 112 respondents was actually used for the questionnaire and 3 top managers were sampled for the interview schedule. Piloting was done on 12 respondents selected using the half split method. Both primary and secondary data obtained was analyzed and presented with the aid of statistical package for social sciences (SPSS Version 20), which provided descriptive and inferential statistics. Correlation analysis was engaged to assist in determining whether and how independent and dependent variables related and thereafter a content analysis was undertaken to establish the extent of the relationship between reverse logistics and profitability.

8.1.1 Contributions of Reverse Logistics to profitability

The findings showed that RL was one of the major processes at KP. The study further revealed that the scrap value which majorly contributes to the revenue from RL varied over the years. In this regard, findings showed that scrap value was estimated at 20 million, 500 million and 10 million by respondents. A mean of 175 million represented the potential value of returns at KP. The key source of scrap was reported to be steel metal, copper conductors, aluminum conductors, scrap metal, transformers and switch gear, cables, scrap poles and furniture. It was also established that RL helped in saving space besides freeing capital. Further, RL enabled efficient use of materials and reduced overall costs. It was also argued that RL initiatives contributed to additional revenue for the company, improved working environment and enhanced the company image through disposal and cleaning. The contribution of RL was also measured in terms of total revenue as a percentage of gross profit. The revenue obtained from disposals was estimated to account for 5% of the gross profit at KP.

The value of returns and disposals at KP was estimated over duration of three years by the respondents. Product returns were valued at 60 million for the year 2012, 100 million for the years 2013 and 150 million for the year 2014. The findings showed that RL at KP did not involve packaging returns. On the other hand, revenue from disposal showed growth over the years and was valued at 100 million for 2012/2013, 400 million for 2013/2014 and projected at 450 million for the year 2014/2015.

In attempts to recoup value from returns through RL, the findings revealed that KP faced a myriad of challenges in the management of RL. Among the major challenges that were reported included legislation which was highly regarded towards the tedious process stipulated in PPDA, (2005). Consequently, it was found that vandalism was among the major challenges where respondents argued that company stock was exposed to theft by staff in conjunction with scrap dealers. Findings also revealed that bidders often delayed in collecting items within stipulated time besides irregular disposals by the company. It was also established that among other challenges, there was lack of timely communication, poor planning and lack of knowledge and appreciation of users.

It was found out that there were plans to outsource RL activities at KP as reported by all the respondents. These activities include the use of auctioneering, appointed agents for disposal of hazardous substances, repair of motor vehicles and faulty transformers and so on. These findings are in line with the view that third parties specializing in returns have seen demand for their services greatly increased. The findings therefore showed that RL significantly contributed to profitability at KP.

8.1.2 The Cost of Reverse Logistics

The second objective of the study was to assess the relationship between cost of RL and profitability of KP. It was revealed that at 58%, transaction cost was the major component TLC at KP. Secondly, transport cost was averaged at 26% of TLC. The total cost of RL is the summation of both the reclamation and disposal costs, which were found to represent 7.9% and 9.6% of TLC. These two costs amounted to 17.5% of TLC at KP.

8.1.3 Drivers of Reverse Logistics

The research established the following drivers for RL in the order of importance at KP: Material surplus at the point of use were the core reason for returns. This was followed closely by the need for repairs. The third reason for returns was so that goods could be re-worked. Obsolete materials were also often returned to source. The research study also established that other reasons for RL at KP were as a result of production left over, end of product life and products with short life cycle. Respondents were not sure if the need to claim warranty, product recalls and liberal return policies at KP had any impact on accelerated returns.

The findings revealed that the most preferred method of disposing returns at KP was by public auction as reported by majority of the respondents. On a similar note, the findings showed that returns at KP were also disposed through sale by open tender. The study further revealed that the bulk of the respondents were uncertain whether returns at KP were disposed through re-use, salvage or repair. The study also found out that returns at KP were never disposed through transfer to another public entity or through donation, destruction or disposal to public servants and trade in.

The findings showed that RL at KP benefits both the organization and its customers. It was reported that RL at KP was aimed at enhancing profitability. In addition, it was also agreed upon that RL reduced overall cost of inventory at the Company. In the course of disposing waste, the respondents agreed that KP complied with NEMA regulations. It was reported by the respondents that KP did not use RL as a competitive strategy. A sizeable number of employees were not aware whether there was training towards implementation of RL, transportation cost was a major barrier, there were adequate resources for implementation of RL strategy, and material returns were regarded by the management of KP and whether employees at KP were aware of its return policy.

8.1.4 Strategies of Minimizing Waste

Findings of the research study established that the major objective of RL at KP was to improve on asset utilization. It was also revealed that RL at KP was necessary because it has potential profit source to the company as reported by majority of the respondents. Another section of the respondents reported that RL was aimed at complying with the environmental legislation. Additionally, RL strategies at KP were aimed at reducing cost of operations. Other objectives of RL included; to promote corporate citizenship, improving customer satisfaction, and to protect market brand. The economic drivers included direct and indirect profits related to reduced production costs, green image, market protection and improved customer/supplier relations The research established that the most important waste management strategy at KP was asset recovery. It was also reported that use of centralized return centers for disposals was an equally important waste management strategy at KP. Findings showed that respondents were not sure on other waste management strategies including; liberal return policies, Use of IT and T systems in the management of RL, RL is used to improve customer satisfaction, reduced return processing cycle time, provisions for risks associated with returns, purchase of greener products and imposing penalties on lost value. Finally, it was established that KP did not use RL as a differentiation strategy.

8.2 Conclusions

This research study in the energy sector in Africa as a whole and Kenya in particular compliments those carried out by Breen (2006), Dhanda et al, (2005) and Lau, & Wang, (2009), the latter two who focused on RL in developed countries. The work of Rogers, (1998) focused on RL in other but the energy sector. It achieved the objective of enriching Krupp's (1993), strategies of minimizing waste from 2 to 8. Although there is a consensus that with the research by Stock (1998) that RL's potential is growing, the study has further quantified it in monetary terms. To supplement Guide's (2000) contribution, the study has revealed that most challenges to the effective management of RL result from organizational culture and policy. This conclusion, together with others is detailed in the proceeding section.

8.2.1 Contributions of Reverse Logistics to Profitability

By contributing up to 5% of the gross profit at KP in revenue, RL was considered a key ingredient of organizational profitability at KP. A mean of 175 million represented the potential value of returns at KP, while the highest revenue from RL was estimated to be 100 million. This is Kshs 75 million less the potential and this difference explains the reason for accumulation of scrap over the years. It was therefore concluded that major contributors of scrap at KP were all forms of scrap metal, transformers and switch gear, cables, scrap poles and furniture. Consequently, the findings of the study led to the conclusion that RL has many other benefits such as saving storage space besides freeing capital, it enabled efficient use of materials and reduced overall costs. RL initiatives contributed to improved working environment and enhanced the company image. As a result, it was concluded that RL contributed significantly to the profitability of KP.

Revenue from disposal showed growth over the years and was estimated to reach 450 million for the year 2014, although no packaging returns were recorded. The management of RL at KP faced a number of challenges including, legislation which was highly regarded towards the tedious process stipulated in PPDA, (2005), vandalism, delay by bidders to collect items within stipulated time besides irregular disposals by the Company. Additional challenges included poor planning and lack of knowledge and awareness by staff. KP had plans to outsource RL activities.

8.2.2 The Cost of Reverse Logistics

The study findings concluded that at 58%, transaction cost was the major component TLC at KP. On the other hand it was concluded that the total cost of RL is the summation of both the reclamation and disposal costs, which were found to represent 7.9% and 9.6% of TLC hence 17.5% represented TLC at KP. This cost has a great impact of RL activities and proper management and control is required so as not hinder the successful implementation of RL at KP.

8.2.3 Drivers of Reverse Logistics

The study concluded that there is a significant relationship between the effect of RL drivers and profitability. The drivers for RL at KP have been listed above in the order of frequency of application. The findings concluded that the most preferred method of disposing returns at KP was by public auction and sale by open tender. In addition, it was also concluded upon RL reduced overall cost of inventory at the Company. Further it was concluded that RL at KP was conducted in a manner that complied with NEMA regulations in waste management. In the analysis of the barriers to RL in India, Sharma, et al, (2011) identifies the same drivers with a bias for the service industry.

8.2.4 Strategies of Minimizing Waste and Profitability

The findings of the study showed that there is a significant positive relationship between waste minimization strategies and profitability. It was therefore concluded that the major objective of RL at KP was to improve on asset utilization besides being a potential profit source to the company. RL was aimed at complying with the environmental and reduce cost of operations. The study concluded that the major waste management strategy at KP was value recovery. It was also reported that use of centralized return centers for disposals was also an important waste management strategy at KP. By enabling efficient use of materials, RL strategies at KP were effective in minimizing waste. These findings were consistent with that of De Brito et al (2004) who classified the drivers of RL into three main groups; Economics, Legislation and Corporate Citizenship.

8.3 Recommendations

Based on the analysed results, a number of recommendations for future actions and the prioritisation of these have been developed. The recommendations relate to each of the objectives and are separated between institutional and policy actions.

8.3.1 Contributions of Reverse Logistics to Profitability

The results from the discussion above shows an urgent need for training employees on effective execution of RL and providing adequate resources for implementation of RL strategies as well as promoting KP return policy. This initiative should be preceded by the development and implementation of the disposal plan alongside the procurement plan. Measures should be undertaken to create and assign special teams and profit center to deal with RL function. Stake holders in the energy sector should ensure that the disposal plan for each organization is provided and approved together with that of procurement.

8.3.2 The Cost of Reverse Logistics

There is need to improve accuracy of posting for revenues from disposals on the account designated for RL. This would enhance the understanding of challenges associated with RL and also provide for accountability and responsibility on RL activities. Since the cost of RL was found to have a significant effect on profitability, preventable costs such as transport, legal fees and licenses should be controlled.

8.3.3 Drivers of Reverse Logistics

The study also recommends that KP should re-assess its material issuance system in order to reduce instances of surplus materials being issued to users. If this surplus is not returned, it can be a source of preventable loss to the Company. There is also need for the decentralization of the disposal process. This will go a long way in eliminating the lapse in the execution of the return strategy by empowering

regional offices as well as eliminating the need for transportation of returns to CRCs.

Findings on table 4.4 show that there is limited re-use or recycling of materials contrary to expectations. This is where opportunities for cost savings lie. The government should re-double its efforts in supporting re-cycling by instituting tax incentives to organizations deal in waste recycling.

8.3.4 Strategies of Minimizing Waste

The study recommends that KP should create awareness among its employees on the contributions of RL focusing on organizational profitability because a large portion of respondents reported lack of awareness of certain strategies in the study. Top management should particularly enhance these strategies and promote RL in order to tap the full contributions with regard to profitability as only a small fraction of the revenue from RL is actually realized.

RL management at KP in particular and the Energy Sector as a whole face a lot of challenges; the study revealed that majority of employees were ignorance of the meaning and benefits of using green products. Special training is necessary for middle level management to promote the concept. The Government of Kenya should organize special campaigns to promote the use of greener products and reward top user.

8.3.5 Recommendation for Further Studies

The study limited itself to the use of RL on organizational profitability at KP. Similar investigation may be carried out on other organisations such as universities, ministries, counties and so on so as to provide a rich platform for meaningful comparisons. It has been argued that industries that implement remanufacturing operations can save 40 to 60 per cent of the cost of manufacturing a completely new product (Dowlatshahi, 2000). This belief is however not backed by a specific study of a firm. More studies should be undertaken in this area to test this hypothesis and provide real data to support the figures. Finally, the study proposes for a study of the cost-benefit analysis of undertaking various RL activities in various organizations in order to provide a tangible business case for RL strategies andpractice.

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