



**EFFECT OF PRODUCT RECYCLING PRACTICES ON THE PERFORMANCE OF AGRO PROCESSING FIRMS IN UASIN  
GISHU COUNTY, KENYA**

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**ABSTRACT**

*Superior performance of an organization now depends on its ability to become a fully integrated partner within a supply chain context hence focusing on delivering customer value through logistics as a means of remaining competitive. The objective of the study was to determine the effectiveness of product recycling on the performance of Agro processing firms in Uasin Gishu County. The stakeholder's theory was used in conceptualizing the relationship between product recycling and organization performance. The study covered the core functional areas such as administration, transport department, procurement department, warehousing departments, marketing as well as customer service. Data was collected by use of questionnaires. The instruments were tested for validity and reliability before administering. Data was analyzed by use of both inferential and descriptive statistics using SPSS version 24. The study findings showed that product recycling was significant to performance of Agro processing firms in Uasin Gishu. The study concluded that product recycling affects the performance of Agro processing firms. The study therefore recommended that Agro processing firms in Uasin Gishu should formulate and implement product recycling to enhance strategic performance and implementation of product recycling practices for enhancing the performance of Agro processing firms in Uasin Gishu County.*

**Key words;** *Recycling, Performance, Processing and Reverse Logistics*

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## INTRODUCTION

In today's dynamic and competitive environment, logistics management remains instrumental in the overall corporate governance through asset management and financial flows of the company. This asserts the centrality of logistics as a competitive advantage strategy in many industries (Kenyon & Meixell, 2007). This is evidenced by its role in reducing costs and improving business performance (Fugate, Mentzer & Stank, 2010). In this regard companies remain under obligation to respond to changing customer needs, and logistics flexibility to realize high business performance. There is numerous evidence of the increased organization performance generated by the use of reverse logistics in the existing logistics processes and, in general, in the established supply chains (Somuyiwa, 2014). Reverse logistics system defines a supply chain that is efficiently restructured to manage products or parts flows destined for remanufacturing, recycling or disposal (Dowlatshahi, 2005).

Besides customers and governmental regulations regarding environmental impact of products and processes is forcing companies to explore greener alternatives and implement new practices of product returns management (Prahinski & Kocabasoglu, 2006; Pochampally, Nukala & Gupta, 2009). However reverse logistics is ingrained with the biggest operational challenges in the world of manufacturing since the activities involved are many and tend to be so varied. Profitability of recoverable assets through reverse logistics is an enabler for disposition strategies to attain increased organization performance (Skinner et al., 2008). The stakeholders have the capacity to influence the operations of the organization for profit motives and environmental concern which remains the prime agenda of reverse logistics. This argument is also augmented by institutional theory which posits that there are structures, rules, norms and routines that act as the framework for behavior of organizations. This echoes

the essence of firms embracing reverse logistics due to pressures from the customers who value firms that are ecologically friendly and a platform for high effective product returns thus increasing the performance of the organization.

These theories underpin the value of adopting reverse logistics as a precursor of organization performance (Ninlawanetal., 2010; Sillanpaa& Kess, 2012). However the potential neglect of the reverse logistics process can reduce the amount of value the firm may extract from returned product, negatively impact customer relationships, and possibly increase reverse logistics costs due to inadequate management oversight of the process. The success of reverse logistics implementation requires the coordination of forward and backward flows of both materials and information (Guide & Van Wassenhove, 2002). These must be tempered with six reverse logistics capabilities that have impact on companies' performance: logistics information management, close-loop capability, supply chain integration, supply chain coordination, conformity capability, and institutional incentives. However, management of organizations in developing countries continues to ignore or consider reverse logistics as less important in business processes than the classic product flow - manufacturer-distributor-user (Azevedo et al., 2011; Nebojsa et al., 2017).

Globally the examination of reverse logistics has become more prominent in both the business community and academia in recent years (Dowlatshahi, 2012). In this regard logistics managers realize that the reverse channel is a target for gains in efficiency and reduction of costs and have started to give more attention to this area, thus employing reverse logistics as a potential market differentiator and profit center (Stock & Mulki, 2009). European Union (EU) legislation has highlighted the importance of products recovery and recycling through waste management policies which is a reverse logistics practice (Mario & Manfredi, 2013 ). Global

Environmental Management Services an organization based in Saudi Arabia has mandated itself to provide technology systems, products and services for waste management (reduction, recovery and recycle), industrial effluent treatment, sewage treatment, odour control, bioremediation and environmental cleanup (Global Environmental Management Services, 2015).

However, management of organizations in developing countries continues to ignore or consider reverse logistics as less important in business processes than the classic product flow - manufacturer-distributor-user (Azevedo et al., 2011; Nebojsa et al., 2017). Reverse logistics is relatively more practiced in an organized way in the developed world than in the developing countries in that the latter provided less value additions on reversed products. Poor logistic systems and management significantly contribute to the poor performance of Agro-industries in developing countries especially, in Africa (Johnson, Nketia & Quaye, 2015).

Reverse logistics of waste in Uganda is taking course as a result of partnerships of the private enterprises and the municipality (Kinobe, Gebresenbet & Vinneras, 2012). Recovering of reusable materials is undertaken by the informal people driven by poverty and the activity acts as a source of income to many poor communities.

The main challenge facing the manufacturing industry in Kenya is the lack of a legal framework for waste management vis-à-vis reverse logistics (Kaberger & Richu, 2015). Furthermore, manufacturers in Kenya have to cope with all kinds of returns, from apparel that just didn't suit the customer needs and expectations, to expired products that are no longer saleable to recalls that endanger public safety (Njuguna & Kagiri, 2017). Also, the manufacturing industry business has to deal with damaged, unwanted, outmoded, leaking, spoiled, or counterfeit

merchandise which accounts to 40 to 60 percent of the returns (Njuguna & Kagiri, 2017).

### **Statement of the Problem**

Producers and Marketers of agricultural produce incur post-harvest losses ranging between 30-75%, an index of low performance due to poor logistical activities (Oparanya, 2012). Besides African countries where Kenya is not an exception are suffering largely due to the non-application of the principles of supply chain management practices such as reverse logistics to business activities. These obviates the biggest operational challenges in the world of manufacturing ingrained in reverse logistics. Reverse logistics practices can reduce the customer's risk when buying a product, and increase the customer value. The designing an effective and efficient reverse logistics system is a prerequisite for remanufacturing and a key driver for providing the economic benefits necessary to initiate and sustain customer relationship and customer loyalty hence improving organization performance. These altogether points lacked consensus on the effect of product recycling practices on the organization performance providing a gap to be filled by the current study.

### **Specific Objective**

To determine the effectiveness of product recycling practices on the performance of Agro processing firms in Uasin Gishu County.

### **Research Hypotheses**

Product recycling practices has no statistically significant effectiveness on the performance of Agro processing firms in Uasin Gishu County, Kenya

## **LITERATURE REVIEW**

### **Theoretical Review**

#### **Stakeholder Theory**

The theory was put forward by Freeman (1984). The stakeholder theory argues that the organization has relationships with many constituent groups and that it can engender and maintain the support of these

groups by considering and balancing their relevant interests (Freeman, Strategic management: A stakeholder approach., 2010). As it has been noted by many, the theory fosters both instrumental predictions and normative prescriptions. This has therefore proven to be a subject of interest with those interested in profits as well as those interested in issues of ethics. Stakeholder theory is a theory that looks at the relationships between an organization and its internal and external environment, how these relationships affect the organization's mode of conducting its activities (Jones & Jones, 2013).

The caveat to stake holders' theory is that corporations have only one duty to promote their own and their owners' interests. In this regard they have no capacity and their executives no authority to act out of a genuine sense of responsibility to society to avoid causing harm to people and environment or to advance public good in ways in conflict with their own interest (Mansel, 2009). Taking any wider public interest into account remains subservient to the obligation of corporations to make profits. Therefore the wider social good can only be subordinate to the interest of making profits. This in its totality goes against the grains inordinate priorities that should place the interests of the societies over self-interest.

## **EMPIRICAL REVIEW**

### **Recycling Practices and Performance of Agro processing firms**

Recycling is the breaking down of a used product into its component parts and reprocessing it into new or original forms. Examples of recyclable materials are plastic items, paper, glass, batteries, bulbs and metal materials (Tanskanen, 2013). The process of recycling begins from bin collection where bins containing recyclable materials are taken. The bins are then transported to the firm. The materials are sorted, cleaned and then processed. The sorting process depends on the materials to be recycled. For example, steel cans are sorted using a magnet

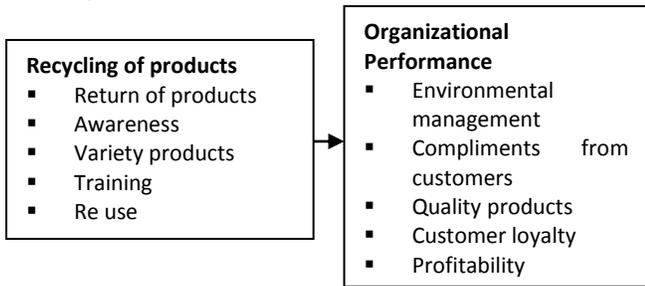
separation process. Recycling is the process of recovering any piece of a returned product that may contain value. In recycling, collected used products are disassembled and useful material extracted from them. The identity and functionality of the original material is lost. Organizations may create awareness by putting the recycling labels of three arrows intertwining clockwise as a sign that the product or package should be recycled (Laosirihongthong, Adebanjo & Tan, 2013).

There is a link between recycling and operational performance. Recycling saves a firm the cost of transportation of materials to be disposed and the cost of land acquisition for a landfill. For instance, in New Zealand, the setup costs for a landfill vary between \$2m to \$30m with annual capacities between 10,000 tonnes to 500,000 tonnes (Salim, 2016). Secondly, recycling saves the firm energy consumption and promotes material recovery. The material usage per unit of output is reduced and therefore yield improved eco-efficiency (World Business Council for Sustainable Development, 2000). Thirdly, recycling promotes environmental conservation. According to NEMA (2007), over 2,000,000 plastic bags are generated in Nairobi. In conclusion, for manufacturing firms to implement the above reverse logistics practices, they would need to set up waste collection mechanisms, warehouses, disassembly or recycle plants and final treatment or landfill areas for final disposal.

Rodgers, Tibben and Lembke (2002) observed that recycling accounts for approximately four percent of the total logistics costs in the publishing industry. In the retail and manufacturing sectors, it is estimated that recycling accounts for 56 percent of total logistics costs. Kangethe (2013), discussed the role of recycling in e-waste management in East Africa and found environmental sustainability, economic prosperity and social value recovery of consumers by individual firms, market expansion through appealing waste management policies, assets optimal

utilization, product or environmental returns, as the outcomes of recycling.

**Conceptual Framework**



**Independent Variable**      **Dependent Variable**

**Figure 1: Conceptual Framework**

**Source: Author (2019)**

Recycling is the process of recovering any piece of a returned product that may contain value. In recycling, collected used products are disassembled and useful material extracted from them. The identity and functionality of the original material is lost (Eltayeb et al., 2011). Practices under recycling include return of used products and packaging to suppliers for recycling, executing well-structured market incentives and having a well-documented recycling policy.

**METHODOLOGY**

This study adopted an explanatory research design. The research design is ideal when determining the degree to which variables are associated and making predictions regarding the occurrence of social or physical phenomena. The study adopted a cluster

random sampling technique. Researcher distributed the questionnaires to each department of every cluster approximately equally. The study used a descriptive survey in data collection which is the use of quantitative methods through administering of the questionnaire, as well as a qualitative approach by reviewing existing literature (Bryman, 2006). A five point attitudinal scaling was used to measure levels of attitude towards questions involving both open and closed ended questions. The items adopted a 5 point Likert Scale (1-Strongly agree, 2-Agree, 3-Undecided, 4-Disagree and 5-Strongly disagree). Internal validity was used to show to what extent the collection and analysis and interpretation of data relates with the research variables. Application of Statistical Package for Social Sciences computer software (SPSS) was used to critically analyse the data for easy understanding. Editing and coding was done to reduce the inconsistency of values and enhances presentation of data by use tables and facilitated the accuracy of the questionnaires.

**FINDINGS**

**Recycling Practices and Performance of Agro Processing Firms**

The researcher sought to establish the effect of recycling practices on the performance of Agro processing firms in Uasin Gishu County.

**Table 1: Descriptive Statistics for Recycling practices**

Responses	SA %	A%	UD%	D%	SD%	MEAN	SD
i) Used products are returned to the manufacturer for recycling	47.7	35.1	10.3	4.6	2.3	4.21	.965
ii) The organization creates awareness to the public about recyclable products	37.9	32.2	19.0	9.2	1.7	3.95	1.047
iii) During recycling a different product can be made	32.2	33.3	19.0	7.5	8.0	3.74	1.215
iv) Firm trains employees on reuse and recycling as waste management strategies	40.2	29.9	23	1.7	5.2	3.98	1.083
v) Collecting used packaging from customers for reuse	19.5	55.2	20.1	1.7	3.4	3.86	.872

The findings in Table 1, showed that majority of the respondents agreed that, used products were returned to the manufacturer for recycling (M=4.21 SD=0.965), on whether organization creates awareness, respondents both agreed and strongly agreed that the organization created awareness to the public about recyclable products (M=3.95 SD=.1.047). Furthermore, majority of the employees both agreed that during recycling a different product could be made (M=3.74 SD=1.215). Majority of the respondents were in agreement that firm trained employees on reuse and recycling as waste management strategies (M=3.98 SD=1.083), 6.9% disagreed while 23% undecided. Lastly, the respondents agreed that collecting used packaging from customers for reuse (M=3.86 SD=.872). These findings were in line with the findings of Eltayeb *et al*, (2011) who found out that recycling of products made a major contribution to performance of industries. Hence, the results implied that the performance of Agro processing was dependent on the recycling practices which led to good performance of the firm.

### Hypotheses Results

**Table 2: Summary for Hypothesis Testing**

Hypothesis	$\beta$ and P values	Decision
Ho <sub>1</sub> : Product recycling practices has no statistically significant effectiveness on the performance of Agro processing firms in Uasin Gishu County, Kenya	$\beta=0.165$ ; $P<0.05$	Reject Ho <sub>1</sub>

### SUMMARY

The objective of this study sought to determine the effectiveness of recycling practices on the performance of Agro processing firms in Uasin Gishu County. Findings confirmed recycling practices as having a positive and significant relationship with performance of Agro processing firms in Uasin Gishu County, Kenya. Findings therefore meant that the null hypothesis that there is no significant relationship between recycling practices and performance of Agro

Independent variables of reverse logistics practices were tested on their significance to performances of Agro processing firms in Uasin Gishu County, Kenya.

### Ho<sub>1</sub> Product recycling practices has no statistically significant effectiveness on the performance of Agro processing firms in Uasin Gishu County, Kenya

Effectiveness of recycling was hypothesized against the performance of Agro processing firms in Uasin Gishu County, Kenya. Findings indicated that recycling practices has no statistically significant effectiveness on the performance of Agro processing firms in Uasin Gishu County, Kenya ( $\beta =0.216$ ;  $p>0.05$ ). Results indicated that recycling influences performance of Agro processing firms by 21.6%. Hence, null hypotheses that recycling practices has no effect on performance of Agro processing was rejected at significance level of 5%. Agro processing firms should consider recycling as a determinant of performance in their firms. Findings concurred with findings of Kenneth, (2013), who found that recycling, enhances organizational performance as indexed by environmental sustainability, economic prosperity and social value recovery of consumers by individual firms, market expansion through appealing waste management policies, assets optimal utilization.

processing firms in Uasin Gishu County was therefore rejected. Thus an increase in recycling practices makes organizational performance to increase. These findings are premised on Stakeholder's theory which calls for building a relationship between the stakeholders by meeting and exceeding their needs to enhance organizational performance. The implications of these results are that the organization may acquire better performance results by embracing efficient recycling practices.

## CONCLUSIONS

Recycling practices was concluded to having a significant effect on the performance of Agro processing firms in Uasin Gishu County. The study provided evidence that the factors associated with recycling practices are overly indispensable in engendering high performance. Recycling can be enhanced through return and packaging of products by the Agro processing firms. Remanufacturing also remains a cornerstone for enhancement of quality and customer value which leads to high performance, this argument has espoused from the findings of this study that remanufacturing significantly affects performance.

## RECOMMENDATIONS

From the study result, findings and conclusions, the study recommended that management of Agro processing firms should strive to implement recycling practices in their organizations as a means of enhancing organizational performance. In fact, the findings contributed to supply chain management in

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terms of providing valuable input to and awareness of reverse logistics practices to consider with regard to enhancing performance of Agro processing firms. Management should formulate policies based on their recycling practices in order to achieve maximal performance. In terms of policy the research findings gave eminence to embedding recycling practices to organization policies in order give impetus to their implementation to achieve high performance.

## Suggestions for Further Studies

Several studies should be undertaken to gain a more comprehensive understanding on this theme in other contexts, future research should also include: Intervening effects of organization policies on the relationship between reverse logistics and performance of Agro processing firms. The use of questionnaires only could have compromised the reliability of the findings of this study thus the researcher recommended the use of multiple instruments.

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