

Factors Affecting Adoption of Reverse Logistics in the Kenya Manufacturing Sector: A Case Study of Coastal Bottlers Company

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Abstract

The competitive environments have led to short the product life cycle for many consumer goods. This has led to complex environmental challenges especially in developing countries. Reverse logistics plays a major role in addressing reducing waste and protecting the environment not only in Kenya but also worldwide. However, the development of the practice of reverse logistics in Kenya is relatively low with only limited number of industries having tried it. The study sought to establish the factors affecting the implementation of reverse logistics in manufacturing companies in Kenya. The study adopted a case study design and stratified sampling technique to select respondents. Data was collected using self-administered, semi-structured questionnaires. Data collected was further analyzed and presented in tables, mean, mode and standard deviation. The study established that legislation, economics, corporate citizenship and collaboration among supply chain partners are major affected adoption of reverse logistics at Coastal Bottlers Limited. The study concluded that the identified factors are very significant in reverse logistics implementation and every organization planning to implement reverse logistic practices should consider them.

Key Words: Reverse Logistics, Supply chain, Environment, Recycling

Introduction

The competitive environments have caused the product life cycle for many consumer goods to continually shrink (Guide & Van Wassenhove, 2003). Consequently, many products of several models are released and dropped every day. These activities are partly being blamed for the complex and difficult environmental challenges facing the world today. These challenges include; soil loss and deterioration, water and forest degradation, atmospheric pollution and climatic changes as well as species and gene-pool extinction (Atusa, *et al*, 2008). In Kenya , this offers challenges such as; clogged drainage and sewers, poor hygiene and health conditions of

most major towns and cities occasioned by heaps of domestic and industrial wastes; reusable and recyclable materials (Japan International Co-operation Agency(JICA), 2010). Given these facts, proper treatment of these products is extremely important to ensure that they are not to be simply released into the environment, but returned to the business cycle (Leite, 2009).

The implementation of reverse logistics is necessary to achieve the goals of sustainable development which focuses on both environmental and economic goals (Dowlatshahi, 2000). Reverse logistics involves re-use and recovery of products, hence reducing the negative effects on environment and waste disposal (Kleindorfer *et al.*, 2005). Lau & Wang, (2009), argue that practicing reverse logistics can help reduce waste and increase profit through an effective recycling process in the developing countries. Furthermore, the increase in awareness on environmental issues and the benefit of recycling places more pressure on firms to create a better reverse logistics strategy. Firms that comply with regulations and stress on environmental protection will have a good goodwill or corporate citizenship among their customers (Leite, 2009).

Statement of the Problem

Plastic wastes are causing an increasingly number of environmental and problems including; choked soils, blockage of drains, animal deaths and food hazards (City Council of Nairobi (CCN), 2006). Introduction of new technologies of disposing waste, involving the 3R recovery flows, Reduce, Reuse and Recycle is a milestone towards achieving the target of keeping Kenya clean and matching other countries in solid waste management(CCN, 2011). However, despite efforts to encourage reuse, recycling and recovery, the amount of solid waste generated remains high and appears to be on the increase (Republic of Kenya (R.o.K), 2012).

In the recent past, all Coca cola franchises including Coastal Bottlers, started abandoning decades of old practice of packaging its soft drink in recycled content containers (aluminum cans and glass bottles) in favour of non-recycled plastic. The impact of this action is to undermine a large part of the nation's recycling infrastructure. Presently Coca cola uses bottles with recycled content in New Zealand, Australia and several Europe countries (Container Recycling Institute (CRI), 2004). If a similar practice is adopted in Kenya, Coastal Bottlers and other franchises of Coca Cola can immediately keep millions of pounds of plastic out of landfills. Coastal Bottlers and other Coca cola franchises in Kenya are not yet fully recycling bottles, with only returnable glass bottles being recycled while plastic bottles are not. This study is therefore intended to bridge the gap by investigating the main factors influencing the use of reverse logistics in the Coastal Bottlers Company Limited.

Research Objectives

1. To determine the influence of legislation on adoption of reverse logistics in Coastal Bottlers Limited.
2. To examine the influence of economics on adoption of reverse logistics in Coastal Bottlers Limited.
3. To establish the influence of corporate citizenship on adoption of reverse logistics in Coastal Bottlers Limited.

4. To examine the influence of collaboration on adoption of reverse logistics in Coastal Bottlers Limited.

Research Questions

1. How does legislation influence adoption of reverse logistics in Coastal Bottlers Limited?
2. How does economics influence adoption of reverse logistics in Coastal Bottler Limited?
3. What is the corporate citizenship influence on adoption of reverse logistics in Coastal Bottlers Limited?
4. How does collaboration influence adoption of reverse logistics in Coastal Bottlers Limited?

Literature Review

Theoretical Framework

The prevailing theories, namely Transactions Cost Economics (TCE), Resource-Based View (RBV) and Life Cycle Assessment (LCA) can be applied to study reverse logistics. TCE specifies the conditions under which a firm should manage an economic exchange internally within its boundary or externally through inter-organizational arrangement. It focuses on minimizing the total transaction costs of producing and distributing a particular good or service. These costs are determined by limited rationality, opportunistic behavior, frequency, uncertainty, and asset specificity involved in the transactions (Williamson, 1996). The first two elements are assumptions that underpin the choice of a firm between insourcing and outsourcing. The last three elements are factors or variables that characterize any transaction and affect the transaction cost. The theory helps determine a firm's boundary and accounts for the efficiency seeking behavior of the firm through inter-organizational arrangements governed by contracts (Baiman & Rajan, 2002).

RBV sees a firm as a bundle of resources and assets and emphasizes the use of rare, valuable, in-imitable and un-substitutable resources to gain sustainable competitive advantage (Grant, 1991). Resources include tangible physical assets, intangible information and knowledge, and capabilities that are built upon effective use of tangible and intangible resources, repeated and refined practices, and accumulated experiences. Capabilities are more difficult to imitate or substitute and therefore add greater value to the firm. The theory helps explain a firm's investment in building capabilities that are difficult for its competitors to imitate or mitigate in a short period of time so as to attain long-term sustainable competitive advantage (Collis, 1994).

LCA is an instrument with which environmental effects of a product during its lifecycle can be integrally assessed. According to ISO, (1997), LCA is divided into four main steps namely; goal definition and determination of the scope, inventory analysis, impact assessment, interpretation. Multiple decisions concerning the scope of measure that reduce the

environmental burden are possible. The LCA can trigger individual companies to implement such measures; it can also result in a joint effort in a specific place in the supply chain; it can even result in a joint decision for a changed product design (Van Sonsbeek *et al*, 1997)

Empirical Literature

Brito & Dekker, (2003) identified three driving forces of reverse logistics; legislation, economics and corporate citizenship. The three drivers are also interlinked and boundaries are sometimes blurred, and reverse logistics is often carried out for a mix of motives. Regarding actors in reverse logistic systems, they divided them in three groups: forward supply chain actors (manufacturers, wholesalers, retailers); specialized reverse chain players (jobbers, remanufacturers,); and opportunistic players (such as charities). With respect to their roles, the actors are actually responsible for operations in the reverse logistics chain

Ravi & Shankar (2005) indicate that a lack of awareness about reverse logistics is one of the barriers to its implementation. The results of the study also prove that there is a strong relation between awareness and practice of reverse logistics (Zhang, 2007). Moreover, Cain (2008) finds that there is a considerable effect of reverse logistics on a company; thus, higher awareness should be generated on the importance of reverse logistics. Sharma *et al*. (2011) also suggest that the awareness of reverse logistics could bring economic benefits by recovery of the returned product for use.

According to Alvarez-Gil *et al*. (2007), supply chain players are suggested to be the motivators of reverse logistics implementation. Ravi & Shankar (2005) found out that the non-cooperation of the supply chain players is one of the important barriers in implementing reverse logistics. In addition, government financial support and policies are important to companies in implementing reverse logistics. Lack of enforceable environmental legislations established by the government may lower the motivation for the organization to consider implementing reverse logistics (Lau & Wang, 2009). Kulshreshtha & Sarangi (2001) suggest that the government may introduce some policies or subsidies in support of reverse logistics. Aksen *et al*. (2009) agree that subsidy from the government can facilitate the implementation of reverse logistics.

Research Design

The study adopted a case study design and stratified sampling technique to select respondents. Coastal Bottlers Company was purposively selected from the food and beverage subsector in the Kenyan manufacturing sector. The respondents were drawn from various departments that are directly involved in the logistical activities of the firm. Data was collected using self administered, semi-structured questionnaires. The questionnaires were piloted to ensure reliability and validity of the instruments. The data collected, was further analyzed and presented in tables, mean, mode and standard deviation. The results were then discussed and reported in relation to research objectives.

Findings

Legislation and Reverse Logistics

The respondents were asked to whether the company has rules, regulations or laws to address the environment concern. Table 4.5 summarizes the results.

Table 1 Existence of Rules, Policies, Regulations and Laws for Environmental Concerns

Existence of Rules, Regulations and Laws	Frequency	Percent
Yes	42	100
No	0	0
Total	100	100

From table 1, it is evident that there exist certain rules, regulations and laws in the company meant for addressing environmental concerns that emanates from the activities of the company. All the respondents (100%) said that there exist such regulations and laws in the company.

The findings of this study indicate that there exist environmental laws and regulations in the company. The findings are consistent with findings of David & Sinclair, (2005) who noted that environmental pressures across the globe have led to development legislation and regulations that places the onus on consumers as well as manufacturer to collect used products and facilitate the disassembly of these products into their constituent parts and then distribute these for reuse, recycling or safe disposal.

The respondents were also asked to provide feedback on whether the laws and regulations were adopted voluntarily or forced on the company by government or other external forces. Table 2 summarizes the results.

Table 2 Sources of the Laws and Regulations

Source of laws & regulations	Frequency	Percent
Voluntary	10	23.8
Forced	07	16.7
Both forced & Voluntary	25	59.5
Total	42	100

From the analysis, it is evident that there were varied opinions in regard to the where the laws and regulations to address environmental concerns. 23.8% of the respondents were of the view that the laws and regulations were voluntarily formulated by the company on their own appeal in attempt to mitigate negative effects of their economic activities. Another 16.6 % of the respondents believe that the laws were forced on them by the government and they are expected to abide by them. The other 59.6 % of the respondents acknowledged that certain laws and regulations are formulated by the company on their appeal while some other pieces of law and regulations are formulated by the government and other environmental bodies and are expected to abide by them.

From the study it evident that a combination of internally voluntary and externally forced laws and regulations drives reverse logistic of Coastal Bottlers Company. The results of the study are consistent with findings of the study by Dekker *et al.*, (2003).

The respondents were expected to rate their awareness of the existing laws and regulations that they should abide by as they carry out their activities. A summary of the response are shown in table 3.

Table 3 Level of awareness of the Laws and Regulations

Level of awareness	Frequency	Percent
Not aware	05	12
Fully aware	14	33
Partly aware	23	55
Total	42	100

Table 3 indicates that, 12% of the respondents were not aware of the environmental laws and regulations that they should observe while carrying out their duties. A large proportion of the respondents (55%) on the hand were partly aware of these laws and regulation. Only 33% acknowledged the full awareness of the environmental laws to be observed.

From the results of the study it is evident that, a majority of the respondents are ignorant of certain pieces of laws and regulations that should be observed in their logistics activities. A study by Lau & Wang, (2009), established that lack of awareness about environmental legislation was a major barrier to implementation of reverse logistics in Chinese manufacturing firms.

Economics and Reverse Logistics

The respondents were expected to identify the economic benefits that can result from adoption of reverse logistics. The table 4 summarizes the results.

Table 4 Economic Benefits of Adopting Reverse Logistics

Benefit	Mode	Percent
Cost reduction	28	66.67
Green image	13	31.0
Improved customer relations	15	35.71
Protect competition	09	21.42
Value added recovery	06	14.28

Table 4 shows that cost reduction was cited by twenty eight (28) respondents as one the major benefits of adopting reverse logistics. Thirteen (13) respondents indicated that an organization benefits from green image when it embraces reverse logistic activities. Further, fifteen (15) respondents agree that adoption of reverse logistics leads to improved customer relations. Feedback from nine (9) responses also shows that a company is likely to shield itself from competition through adopting reverse logistics. A company is also likely to gain from value added recovery when reverse logistics is adopted as confirmed by six (6) responses.

The findings of the study clearly shows that a wide range of benefits accrue to organization that practice reverse logistics. The findings agree with findings (Dowlatshahi, (2010); Brito & Dekker, (2003); Louwers *et al*, (1999).

When the respondents were asked to rate level of importance of economic benefits choice and implementation of reverse logistics, the responses were as shown in Table 5.

Table 5 Importance Accorded to Economic Benefits

Benefit	Mean score	Standard Deviation
Cost reduction	3.71	0.46
Green Image	2.97	0.47
Improved customer relations	2.81	0.39
Protect competition	2.91	0.30
Valued added recovery	3.33	0.53
Grand mean	3.15	

The findings in table 5, reveals that cost reduction and value added recovery are very important in the implementation of reverse logistics. Green image, improved customer relations and protection were rate moderately important in the consideration of reverse logistics practices.

The findings of the study reveals that all the cited economic benefits are important in the choice and implementation of reverse logistics in Coastal Bottlers Company. However, the findings are inconsistent with the study by Ravi & Shanker, (2005), which observed that the degree of importance of various economic benefits was varied. The study observed that mere reduction of costs will not alone increase profits but improved customer relations as a result of company's good image increases sales and reduces unnecessary costs arising from liability litigation thereby widening profit margins.

Corporate Citizenship and Reverse Logistics

The study sought to establish the aspects of corporate citizenship that influences the adoption of reverse logistics in Coastal Bottlers Company. The findings on the aspects of corporate citizenship which influences adoption of reverse logistics are captured in Table 6.

Table 6 Aspects of Corporate Citizenship Influencing Reverse Logistics

Statement	Mean score	Standard deviation
Our company is a good corporate citizen and cares for the welfare of the society.	3.52	0.55
Our company engages in a variety of CSR activities.	3.74	0.44
CSR activities are costly and	2.33	0.65

not beneficial to the company.

Society well- being is major concern in the design of supply chain activities.	4.0	0
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Grand Mean score	3.39
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From data in the table 6, a mean score of 3.52 and standard deviation of 0.55 indicates that there was an agreement with the statement, that the company is good corporate citizen and puts the welfare of the society into consideration in its production and distribution activities. The findings also indicate that, the company engages in a variety of corporate social responsibility beneficial to the society. A mean score of 3.74 confirms that majority of the respondents agree with statement that the company undertakes a variety of CSR activities. However, there was a divided opinion as regarding the cost and benefits of CSR activities. With a mean score of 2.33 and standard deviation of 0.65, the study reveals that, 18 respondents believe that, CSR activities are costly and not beneficial to the company. Twenty (20) respondents disagrees with the statement that that CSR activities are costly and not beneficial to the company, while four (4) respondents strongly disagree with the statement. All the respondents, strongly agrees that the social well-being of all stakeholders is an important consideration in all the company supply chain decisions.

The results of the study are a confirmation that corporate citizenship is major factor that the company considers in its logistical activities. The findings are consistent with Ravi & Shanker, (2005), study which established that societal interests and well-being could influence the company to engage in environmentally friendly practices such as reverse logistics. The design and implementation of reverse logistics should therefore consider well- being of the society.

Collaboration and Reverse Logistics

The respondents were asked whether they think that collaborations among supply chain partners play a major role in the implementation and success of reverse logistics. Table 7 tabulates findings.

Table 7 Role of Collaboration among Supply Chain Partners in Reverse Logistics

Response	Frequency	Percent
Yes	34	81
No	08	19
Total	42	100

The findings in table 7 indicate that collaboration among supply chain partner influence to greater extent, the success or failure of reverse logistics in the company. 81 % of the respondents confirm that collaboration among the partners play a major role in choice and subsequent implementation of reverse logistics. Only a minority of 19 % of the respondents were of a contrary opinion. The findings are consistent with Ravi& Shanker, (2005), study that observed that collaborations among supply chain partners was a major determinant of successful operation of reverse logistics system.

The respondents were further expected to rate the extent to which identified aspects of collaboration among supply partners involved in logistics activities of the company would influence reverse logistics. The results were summarized in table 8

Table 8 Extent of influence Aspects of Collaboration on Reverse Logistics

Collaboration Aspect	Mean	Standard deviation
Cooperation and Relationship	4.42	0.50
Quality of service	4.33	0.48
Capability of partners	4.21	0.78
Flexibility of the partners	4.62	0.49
Efficient information sharing	4.12	0.77
Grand Mean	4.34	

The findings in table 8, reveals that all also aspects of collaboration including cooperation and relationship with company(4.42), quality of service provided by the partner(4.33), capability of the partner(4.21), flexibility of the partners(4.62) and the efficient sharing of information among all partners(4.12) greatly influence the adoption of reverse logistics. The results indicate that all the aspects of collaboration considered influence adoption of reverse logistics to great extent. The company cannot therefore ignore any of these aspects in reverse logistics decisions. The findings of the study are also consistent with Ravi & Shanker, (2005) study findings which highlighted the various important aspects of collaboration that actually influences reverse logistics. The findings also agree with Ho *et al*, (2012), study which had observed that a firm with good cooperation and relationship with other business partners can implement reverse logistics.

Summary of Findings

The general objective of the study was to find the out the factor affecting adoption of reverse logistics in the manufacturing sector. In particular, the study sought to determine the effects of legislation, corporate citizenship, economics and collaboration among supply chain partners on adoption of reverse logistics in the manufacturing sector in Kenya.

The findings of the study revealed that in addition to government law, the company had its own voluntary policies and regulations aimed addressing negative effects of its economic activities on the environment. Though not fully aware of all the legislation governing environmental issues, a majority of the members of staff acknowledged certain level of awareness of existing laws. The findings of this study confirm that indeed, the adoption of reverse logistics in Kenya manufacturing sector is influenced by legislation.

In regard to economics, the findings of this study revealed that, the manufacturing firm can be driven to reverse logistics practices to gain economically. The firm would leap benefits of cost reduction of packaging materials, recover value of returned bottles as well gain green image in the eyes of all stakeholders. This would in turn improve the relationship with the customers leading increased sales and profits. The study further revealed that a company would protect itself from stiff competition by adopting reverse logistics practices. Cost reduction and value added recovery gains were very important in the decision to engage in reverse logistics. This could be attributed to the fact that, the company is a profit making enterprise and therefore reducing costs of packaging materials would contribute positively to its profit margin. The study also established that improved customer relations, green image and protection from competition economic gains were moderately important in choice of reverse logistics model. The results of study indicated that the company under consideration engages in reverse logistics in order to gain economically.

The study was able to establish that indeed, the company's sense of corporate citizenship did influence the decision to adopt reverse logistics. The company put into consideration that it was part of the society and thus should take care of the environment in which it operates. The company was therefore reported to have undertaking a series of CSR activities, thus giving back the society. Reverse logistic activities were considered by the company as part of them being responsible corporate citizens.

The study found out that collaboration among the partners involved in the logistical activities is crucial in ensuring success of reverse logistics. The study also identified several aspects of collaborations that would impact on the effectiveness of reverse logistics. These factors included; coordination and relationship, quality of service, flexibility of the partner, capability of partner and efficient information sharing among partners. All the aspects were found out to influence reverse logistics activities to a great extent. The results show that the quality of support from business partners influences reverse logistics implementation to a greater extent.

Conclusion

The research findings indicate that legislation, economics, corporate citizenship and collaboration among supply chain partners influences a company to adopt reverse logistics. The existence of both voluntary and government environmental laws and regulations would greatly

influence the adoption of reverse logistics by a manufacturing firm. Private firms may also engage in reverse logistics so as to enjoy the economics gains resulting from the practice. Social responsibility of the firm forces them to adopt strategies that are environmentally friendly such as reverse logistics. Collaboration among supply chain partners has great effect on the success of reverse logistics strategy. It could therefore be concluded that the four factors identified as drivers of reverse logistics in different manufacturing firms are important in the design of reverse logistics strategy. Therefore, companies that would like to implement reverse logistics should also consider the above factors, which may bring different effects to the implementation result. However, this research was conducted only in Coastal Bottlers Company, Kenya, and only major dimensions and factors were included. Future studies should be conducted in other industries. More dimensions and factors should also be included to understand better the development and need for reverse logistics implementation.

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