

**GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND PERFORMANCE
OF ALCOHOLIC BEVERAGE MANUFACTURERS IN KENYA**

BY

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DECLARATION

I declare that this project is my original work and has never been presented in any other learning institution for an award of any Diploma or Degree program.

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This research has been submitted for examination with my approval as the university supervisor.

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DEDICATION

The study is dedicated to my Dad, Mum and Bro for their support, encouragement and patience during the entire period of my study.

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ABBREVIATIONS AND ACRONYMS

EABL	-	East Africa breweries limited
EFP	-	Environmentally Friendly Practices
EPA, 1992	-	Environmental Protection Agency Act, 1992
GPN JAPAN	-	Green Purchasing Network Japan
GSC	-	Green supply chain
GSCM	-	Green supply chain Management
HFC	-	Design for Environment
KWAL	-	Kenya Wine Agencies Limited
NACADA	-	National Campaign against Alcohol and Drugs Abuse
NEMA	-	National Environment Management Authority
PFC	-	Per Fluorocarbon
PPRC	-	Pacific Northwest Pollution Prevention Resource Center
ROI	-	Rate of Return
SCM	-	Supply Chain Management
SCOR	-	Supply Chain Operations Reference
UDV Kenya Limited	-	United Distillers Vintners Kenya limited
WCED	-	World Commission on Environment and Development

ABSTRACT

The aim of this research was to determine Green supply chain management practices and how they affect operational performance of alcoholic beverage manufacturers in Kenya. The research study had two objectives: First, to determine GSCM practices adopted by the alcoholic beverage manufacturers in Kenya and secondly, to determine the effect of its adoption on operational performance. The research design for the study was descriptive survey. The researcher proposed to do a census on all the 41 alcoholic beverage manufacturers registered by NACADA in Kenya, 2015. The researcher utilized the statistical package for social sciences (SPSS) software to analyze the efficiency and effectiveness of the data in details. The relationship between GSCM and operational performance were as follows: internal environment had highest and significant relationship, waste management, reverse logistics, investment recovery and green purchasing had high and significant relationship. Eco-design had a low but significant relationship. The research finally concludes that internal environment greatly affects operational performance. It was concluded so because of the commitment of the middle managers, support of senior managers to middle level managers for environmental practices, share of information and existence of cross functional GSCM. The study recommends that the implementation of GSCM should be implemented among alcoholic beverage manufacturers in Kenya because there are benefits that accrue from such implementation. For instance, firms will benefit through increased use of recyclable materials; savings on costs due to effective utilization of available productive resources; reduction of the environmental impact of business processes and reduction of operational costs and risk of prosecution based on anti-environment reasons. The limitations of the study were that the finding were not general hence other manufacturers operating in different economic, social and political environment may find it difficult to use and others the subject didn't interest them. The research also suggests further research to be done on all alcoholic beverage manufacturers including traditional alcoholic beverage manufacturers and also on manufacturers who are registered with other registering bodies (KEBS and KRA) besides NACADA.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Sustainable development has become an invaluable and inevitable trend for companies. Under competitive, regulatory and community pressure, it has become increasingly important for organizations to balance economic and environmental performance (Zhu and Sarkis, 2004). Much of the sustainability concerns has been the impact of organization on the environment. This is because of the deteriorating of the environment e.g. global warming and scarcity of some important natural resources and the global health crisis. This has led to customer demand for sustainable products in which companies will need to make an effort to reduce consumption and waste as to help protect the environment and boost profitability and growth (Tello and Yoon, 2009). Organizations and people must adopt environmentally responsible production and consumption in order to recover environmental quality, reduce poverty and bring about economic growth with resultant improvement in health working conditions and sustainability. Every organization must put measures in place to ensure all dimensions of its operations are environmentally friendly (Dheeraj and Vishal, 2012)

Green is the new green meaning it's not a new concept. Chien and shin (2007) argues green supply chain management is not a new concept since its literature has been developed in this area as early as 1989. However this literature has not been broadly developed making it difficult to understand.

1.1.1 Green Supply Chain Management Practices

Green sustainable supply chain management or green supply chain management evolved from supply chain management motivated by environmental concerns. Penfield, (2008) argues that it's the process of using environmentally friendly input and transforming them through change agents whose by products can improve or be recycled

within the existing environment. This process develops output that can be reclaimed and re-used at the end of their life-cycle thus, creating a sustainable supply chain.

The growing importance of GSCM is driven mainly by the escalating deteriorating of the environment e.g. raw material resources, overflowing waste sites and increasing levels of pollution. However, it's not just about being environment friendly; it's about good business sense and higher profits in fact it's a business value driver and not a cost center (Wilkerson, 2005).

Srivastava (2007) argues green supply chain has its roots in both environment management and supply chain management literature. Sarkis and Zhu(2004) suggests adding the green component to supply chain management including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the customers as well as end of life management of the product after its useful life.

Manufacturers need to work with their supplier of raw material and component in order to produce environment friendly products. By using their purchasing power, the industries can set environment criteria for their suppliers up stream in supply chain. It can result in the greening of the supply chain; GSCM=Green purchasing + Green manufacturing /materials management +Green Distribution/marketing +Reverse logistics. Environmental supply chain management consists of the purchasing functions involvement in activities that include reduction, recycling, re-use and the substitution materials (Dheeraj and Vishal, 2012).

1.1.2Operational Performance

The strategic dimensions by which a company choose to compete is referred to as operational performance (Narasimhan and Das,2001).This means manufacturing capabilities and resources must focus on developing competitive priorities as achievement of competitive advantage depends on the effective translation of competitive priorities into strategic capabilities (Ho et al., 2002).In modern world, successful competition requires creativity which are not reflected in the existing financial statements. Heavy reliance on financial performance measures could hinder future competitive advantage as financial indicators are outcome measures, which do not reflect

drivers of performance and true value creation. Therefore, performance measurement needs to encompass both qualitative and quantitative approaches and measurement. However, the degree of performance measurement depends on the goal of the firm or the individual strategic unit characteristics.

Firms may consider existing financial measures such as ROI ,market share ,profitability ,revenue growth at a more competitive and strategic level. Inventory performance and customer service are more operationally focused but may be linked to strategic levels. In the performance measurement there exist difficulties in developing standards. The performance measurements used may be special to each individual organization or unit within organization reflecting its environmental needs.

Attempts to harmonize performance measurements have been made through several studies. This is in a bid to come up with a universally acceptable principles of performance measurements (Adam et al., 1995; Gunasekaran et al., 2001; Sink and Tuttle, 1990).There findings advocates performance system may have either tangible or intangible measures with a balance of both types, dynamism and multiple presentation at multiple levels, product and process and team approach which links with strategic level is emphasized. Again communication, accountability, provision of intelligence for decision making and linking rewards and performance is emphasized. Sarkis (2005) also suggest performance measurement should involve performance management.

Among measurement tools which have received universal acceptance is supply chain operation reference (SCOR model) which enables users to address improve and communicate supply chain management practices within and between all interested parties in the extended enterprise. SCOR is the cross–industry de-factors standard strategy, performance management and process improvement diagnosis tool for supply chain management. It spans from supplier’s supplier to the customer’s customer. Its three strong holds include process modeling and re-engineering, performance measurements and the best practices. It’s also based on six management processes which includes; plan, source, make, deliver, return and enable.

The competitive priorities literature (Ferdows and De meyer, 1990; Ward et al., 1998) offers a useful approach in measuring operational performance. Skinner (1974) explains the idea has its root in the trade-off approach whereby a manufacturing operation cannot perform in all dimensions and has to define priorities. Therefore, the most basic competitive priorities are cost, quality, flexibility and delivery (Boyer and Lewis, 2002; ward et al., 1998).Snyder and war (1990) introduce fifth priority of innovativeness.

1.1.3Alcoholic Beverage Manufacturers in Kenya

The national authority for campaign against alcohol and drugs abuse (NACADA) estimated that15 million Kenyan's 40million people takes alcohol, Kenyans loves for booze! The Kenyans massive growth in population, growing middle class, ever dynamic private sector, trade up from home brew and unbranded alcohol into branded product, growing adoption of western culture among middle class, increased levels of international travels have led to this incredible growth This growth is still promising in future dates. However, according to Euro Monitor international (2014), this growth has declined due to factors such as taxation –value added tax and deduction in tax incentives which negatively affected EABL senator keg brand and spirits. However, it's opening up opportunities for other firms in Kenyan beer market. Other factors are strict laws which are dynamic and inflation.

East Africa breweries limited, is the dominant beer industry in Kenya controlling 83 percent of the beer market (Euro monitor international, 2014).However, competition has increased in recent years as both microbrewers and macro brewers attempts to take advantage of naturally expanding market. Again the company is facing challenges in maintaining competitiveness through quality, increased operation costs, especially energy related costs and sustainable end-to-end supply of raw material in order to ensure continued regional leadership in growth and most profitable share (Kiereini, 2011).

Keroche breweries limited (the only Kenyan local brewery) has been identified as one of the major local competitor. The firm is expanding its production capacity by more than 10 –fold and plan to list in stock exchange in the next five years. Consequently, it will increase its market share to 20 percent from 5 percent (Karanja, 2015). This will make inroad against EABL.

With regard to spirits, EABL continues to lead with a volume share of 27 percent followed by UDV Kenya limited with a volume share of 14 percent. London distillers Kenya ltd and Kenya wine Agencies follows with total of 11 percent and 8 percent respectively (Euro monitor international, 2014).

Wine in Kenya is dominated by international brands. The situation is due to the high brand awareness among wine consumers, developed distribution networks for imported brands in comparison with local brand and greater shelf space given to imported brands as opposed to domestic wines. Kenya is second brandy market in Africa and most countries from outside leverage on that e.g. South Africa. Kenya wines agencies limited (KWAL) which are owned by government dominates the Kenyan local wine manufacturers'. KWAL also solely distribute Distell products which are South African owned. Its local brand includes Simba cane, Kibao vodka and Yatta wine. The threat of new entrants e.g. the giant Heineken lager beer has become a threat to the local brewing firms, it reduces profit margin for them, another challenge for brewing firms in Kenya is the desire by most individuals to adopt to health life styles this is due to the campaign for health life style which advocates reduction of consumption of alcoholic beverages (Adetu, 2011).

Alcohol beverage manufacturers in Kenya have been identified to have a significant impact on natural environment, such as energy crisis, ecological destruction and wastage of resources from source to the end user. It has been identified as affecting the environment through emission of toxic fume, spillage of oils which do not easily break down into waste water, heavy consumption of fuel and packaging and disposal issues (Huang Feng and Cai,2000).Consequently the industries are subject to increased pressures and scrutiny from customers, the government through agencies such as national management authority (NEMA) and competitors the alcoholic beverage manufacturers are therefore forced to seriously consider their environmental impact while doing their business.

1.2 Statement of the Problem

Green supply chain management is a powerful way to differentiate a company from its competitors and it can greatly influence the plan success. With increased awareness to corporate responsibility and the requirement to meet the terms with environment policy (Dheeraj and Vishal,2012).According to Green et al. (1997) in the context of deteriorating environment, GSCM stand for innovation in supply chain management and industrial purchasing. The effect of GSCM expands to all areas both tangible and intangible (Molla, 2011).

Various research about green supply chain management practices and performance have been carried out in different industries. Zhu et al. (2005) found out that enterprises have increased their environmental awareness due to regulatory competitive and marketing pressures and drivers

Zhu (2006) studied green supply chain management pressure, practices and performance within the Chinese automobile industry in which he observed that increasing pressure from variety of directions have caused the Chinese automobiles SCM to consider and initiate implementation of green supply chain management practices to improve both their economic and environmental performance.

Chung –Hsiao (2008) studied the GSCM in electronic industry in which he mentions that there various approaches for implementing GSCM practices which has been proposed and recognized in previous literatures according to the author, but there is yet no investigation that identifies the reliability and validity of such approaches particularly in electronic industry. His findings indicated that these enterprises would emphasize on supplier management performance in the crucial role of implementing green supply chain management.

Zhou (2009) study on the implementation of GSCM in textile enterprises in which he argues green supply chain management is a sort of modern management mode which could comprehensively consider the environmental influence and resource utilization efficiency in the whole supply chain and how to implement the green supply chain management in special industrial operation at present has become into one of hotspot

problems. Robert and Benjamin (2010) introducing green transportation costs in supply chain modeling in which they think escalating environmental concerns with prevalent transportation modes has led to an increased interests in the adoption of 'green', sustainability practices in the area of supply chain management.

Locally, Mwirigi (2007) did a survey on GSCM practices by manufacturing firms in Kenya his findings were important as they gave ways of overcoming environmental impacts which comes as a consequence of manufacturing operations since environmental impact occurs at every stage of product life cycle. Obiso (2011) studies concerning GSCM in petroleum marketing firms in Kenya, her findings were adoption of the practices had a positive relationship with environmental performance of oil companies.

Abuko (2011) study on the impact of GSC practices on the performance of oil companies in Kenya her findings were that adoption of GSC practice positively impacts productivity, cost saving, efficiency and quality improvement. Warner (2012) study on green supply chain management and supply responsiveness among food and beverage manufacturing firms in Nairobi, the study established benefits experienced by firms that implement GSCM were improvement in information systems, use of recyclable materials is promoted, cost saving by a firm, and reduced environmental impact of business process and reduced risks of prosecution based on anti-environmental reasons. Chege(2012) study on GSCM practices and supply chain performance of private hospitals in Nairobi, Kenya, concluded that waste management practice was the most significant as compared to other GSCM practices.

Although several studies have been conducted in the area of Green Supply Chain Management, none has been able to address the GSCM in Alcoholic beverage manufacturers in Kenya. This study therefore sought to establish how adoption of GSCM practices impacts firms' performance in those organizations.

1.3 Objectives of the Study

The objectives of this study are:

- i. To determine GSCM practices adopted by alcoholic beverage manufacturers in Kenya.
- ii. To determine the effect of adoption of Green Supply Chain management on operational performance of alcoholic beverage manufacturers in Kenya.

1.4 Value of the Study

The information will be used by local manufacturing companies to work with the local communities in improving the environment for better and safer country in future. The study will also form a basis for further research and a source of secondary data for scholars in supply chain management field. The finding will generate new knowledge in the area of green supply chain, environment & conservation and corporate responsibility in alcoholic beverage manufacturers. Manufacturers in the alcoholic beverage can make use of knowledge to implement effective eco-friendly practices and performances that will enhance their competitive advantage and improve their profitability.

Further, the research will contribute positively to the body of knowledge by providing policy implications for the Kenyan government in supporting GSCM practices among different industries.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews information from publications on topics related to the statement of the problem. It covers theories of GSCM practices, GSCM practices, GSCM practices and operational performance and conceptual framework.

2.2 Theoretical Foundation

Industries may have differences and commonalities in their adoption of GSCM practices due to pressure from different stakeholders e.g. government. Theories which explain these have been developed they include: resource based theory and the stakeholder theory.

2.2.1 Resource Based Theory

This theory explains that superior organizational performance is as a result of proper alignment of endogenous organizational design variable with exogenous context variables. It further points out three key factors that may affect the implementation of proactive environmental strategies for instance in GSCM. They include uncertainty, complexity and munificence (Aragon-Correa and Sharma, 2003).

In this context, uncertainty means the rate of change of innovation in the industry and unpredictability of the competitors or customers actions. Managers who are encountering uncertainty in business environment tend to take more risks, become more proactive and use more innovative strategies than managers in a less turbulent business environment. However, carter and carter (1998) disputes this by arguing that uncertainty sometimes do not result into proactive environmental practices because industries may prefer to lessen the needs because of the scarcity of management resources allocation.

Complexity is proliferation and diversity of factors and issues in that environment. The less the complexity the more proactive environmental practices and vice versa (Miller and Friesen, 1983).Munificence moderates the relationship between the dynamic

capability of proactive environmental strategy and competitive advantage ((Aragon-Correa and Sharma, 2003).

2.2.2 Stakeholder Theory

The theory explains industrial degree of environmental adoption as a response to stakeholders' requirements, expectations and preferences (Concepcio'n et al., 2012). It advocates for the top management awareness of expectations for better environmental performance (Lo et al., 2010) as a consequence of pressure from stakeholders firms implement different environmental practices (Sarkis et al., 2010).

Some studies have found a positive relationships e. g firm joining self-regulatory code, Pressure from stakeholders and development of proactive environment strategies as noted by (Javier and Oscar, 2010).Zhu et al. (2012) further argues that stake holder pressure is a key driver for companies to develop a proactive environmental strategy and so implement proactive environmental management practices e.g. sustainable design. Stakeholder pressure factors may include suppliers, consumers and green technology.

Suppliers can affect environmental management decisions within any manufacturing plant as firms pressured follow the correct environmental practices (Nicole et al., 2009). GSC suppliers' measurement is important especially when environmental requirements increases which affects multiple number of firms and entire supply chain.

When suppliers adopt pro-environmental practices they can force the manufacturer to adopt changes e.g. modifying its products and processes to suit the changes requirements (Koh et al., 2012). Again, suppliers can enable pollution prevention through developing technologies; moreover, new products require suppliers' coordination and interactions to address environmental activities (Yen and Yen, 2012).

Due to increased pressure from consumers manufacturers must integrate environmental concerns into their SCM practices (Zhu et al., 2008). Many consumers from all over the world want to buy from environmentally responsible companies. They assess green attributes of a product and services through their purchases (Che at al., 2012).Therefore, cooperation between supplier consumer and other stakeholders can bring sustainability solutions in production-consumption system. Costs associated with greening may hinder

consumer from purchasing green products as green production necessitates extra costs. Consumer may prefer other products which are not green manufactured and are cheaper.

Green technology firms should be selected according to the degree of how they have advanced in greener technologies (Vachon and Klassen, 2006). Greener technology benefits include profitability improvement (Vasilind et al., 2006), Preservation of natural environment and resources, reduce impact of human activities (Wikipedia, 2007) and green technologies is a powerful competitive advantage tool (Green tech, 2010).

2.3 Green Supply Chain Management Practices

To implement GSCM, organizations are required to follow GSCM practices which consist of environmental supply chain management guidelines. GSCM covers both external and internal environmental management. External management includes: internal environment, waste management, reverse logistics, investment recovery, green purchasing and eco-design (Zhu and Sarkis, 2004).

2.3.1 Internal Environment

Zhu and Sarkis (2007) points that internal environment is the practice of developing environmental sustainability as strategic organizational imperative through commitment and support of the imperative from senior and mid-level managers. It's a fact that senior managers' support is necessary and often a key driver for successful adoption and implementation of most innovation technologies, programs and activities (Hamel and Prahalad, 1989).

For success of internal environment, there must be top-level managers, middle level managers, communication between business managers and environmental professionals and cross functional program encompassing GSCM and GSC practices. GSCM crosses all departmental boundaries within and between organizations which is important to successful environmental practices (Apsan, 2000 and Carter, 1998).

2.3.2 Waste Management

Waste management information concerns generation, prevention, characterization, monitoring treatment, handling, re-use and ultimate residual disposition of solid waste

(R.cossu, 1989). King and Lennox (2001) noted that lean production practices and total quality management can lead to improved environmental performance and reduction of waste and hazardous emission to human beings and environment e.g. solid and liquid waste, air emissions and noise in case of manufacturing phase.

Waste management systems includes; use of carbon dioxide refrigeration systems, treatment and control of post combustion emission, use of alternative fuels (e.g. cleaner fuels), treatment and recycle of hazardous wastes, process optimization implementation of waste-to-waste energy process, waste reduction, reuse and recycling approaches, carbon dioxide captures ; reduction of hydro-fluorocarbons(HFC) and per fluorocarbons(PFC) and the use of carbon dioxide refrigeration systems(colicchia et al.,2011).

2.3.3 Reverse Logistics

Product and materials, reuse, is not a new phenomenon. Deposit system for soft drinks, bottles, metal scraps and waste paper recycling are examples which have been in existence for long. However, the reverse logistics is relatively new concept. It is during the last decade, reverse logistic started gaining recognition; many companies haven't entirely realized its importance. The truth is companies see it as an expensive venture and its potential value of effective reverse logistics is often overlooked.

Many studies show reverse logistics has large potential in customer relations (Rogers and Tibben-Lembke, 1999).It is also said to benefit it business and society (Stock, 1992).Companies follow reverse logistics due to regulation pressure, economic and as part of corporate citizenship (De Brito and Deker, 2003).Therefore the link between supply chain management and environmental protection also need to be considered from the opposite perspective (Preuss, 2005).

2.3.4 Investment Recovery

Whether "going green" green really pays has been investigated with conclusive results (king and lennox, 2001, Rao and Hgolt, 2005, Zhu and Sarkis, 2004).Seuring (2004) questions whether the adoption of environmentally sustainability is a win-win situation or environmental and economic trade-off for the supply chain partners.

Zhu and Sarkis (2004) points out that recovery investments put into products is considered a green supply chain management practices as it captures both waste and materials that would otherwise be put into landfills. Toffel (2004) suggests that the need for the end of life products is motivated by legislation. Even in non –regulated markets, some manufacturers have engaged in product recovery to reduce production costs, enhance brand image meet changing customer expectations, protect after market and preempt pending legislation or regulations. Zhu and Cote (2002) investment recovery continues to grow, where pressure from the government has shifted focus from resource subsidies to levying taxes for some resources such as coal and natural gas.

2.3.5 Green Purchasing

Recently, it has been observed that there is an increased profile for purchasing activities within corporations (DTI, 1991; Gattorna and Walters, 1996; Kraljic, 1983; VanWeele, 1994). Empirical studies in a number of sectors suggests that traditional role is being subjected to further re-evaluation in the light of the drive towards better environment management throughout organization and throughout supply chain. Earlier research examined the forces driving environment management identified the major factors such as compliance with regulation and legislation and cost saving (Green et al., 1995).

However, current research suggests that the nature of the firms' response to environmental pressure is leading to much more significance and central role for purchasing and supply management than the function has experienced before. Green et al.(1998) suggestions confirm green purchasing is an effective way of improving industry's environmental performance. Pun, (2006) defines green purchasing as environmentally conscious purchasing practice that reduces sources of waste and promotes recycling and reclamation of purchased materials without adversely affecting performance requirements of such materials.

Green purchasing consists of four major principles which are; to deliberate the necessity before purchasing, considering the environmental impact of a product at all stages of its life cycle, assessing suppliers' environmental management and activities, and gathering environmental information on product and suppliers (GPN Japan). This explains the need

for buyers concerns on environment while selecting products based on their degree of load to the environment from processing of the raw materials to its ultimate disposal.

2.3.6 Eco-Design

Design for environment (DFE) employs design approaches to reduce the overall human health and environmental impact of a product, process or service, where impacts are considered across its life cycle. Firms aim to produce goods at a low cost while maintaining quality, staying competitive in the global market and meeting consumer preference for more environmentally products (EPA 1992). Therefore, to help business meet these challenges, they should be encouraged to incorporate environmental design process. The firm will have saved costs, reduced both environment and business risks, expand business and market opportunities and meet environmental regulations.

EPA (1992) explains the following ways of environmental evaluation: the human health and environmental impact of its processes and products; identify what information is needed to make human health and environmental decisions; conducting an assessment of alternatives; considering cross media impact and the benefits of substituting chemicals; reducing the use and release of toxic chemicals through the innovation of cleaner technologies that use safer chemicals; making product that can be reused and recycled; monitoring the environmental impact and cost associated with each product or process and recognizing that although change can be rapid in many cases, a cycle of evaluation and continuous improvement.

2.4 GSCM Practices and Operational Performance

The quality revolution of the 1980's and the supply chain revolution of the 1990's extend the green supply chain literature with the beginning of corporate environmental management, environmentally conscious manufacturing strategy, and supply chain management literature. Therefore the best practices calls for integration of environmental management with ongoing operations. GSCM can be defined as integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing process, delivery of the final product to

the consumer as well as end-of-life management of the product after its useful life (Srivastava, 2007).

Through various research findings it has been approved that there is relatively strong relationship between GSCM practices (both external and internal) and operational performance. Externally, by interacting with suppliers and customers, studies indicate manufacturer can improve their operational performance (Ellram et al., 2008). Internally, by integrating environmental management system and staff involvement can improve operational performance (Hanna et al., 2000). Porter and van der linde (1995) points out that producing an environmentally friendly product creates a final product that is safer and less costly, and which has higher, more consistent quality and greater scrap value. Research still points out a positive relationship between environmental management and operational performance. Tooru (2001) demonstrate that environmental management system can improve operational performance of a firm. Szwilski (2000) suggests that an environment management system is an innovative environment policy and informational management tool for industry to improve organizational operational performance.

However, compared to economic performance and inter firm linkages performance, operational performance research is still limited. Frosch (1994) argues that inter-firm linkage facilitated by proximity can lead to improvement in environmental performance. Wagner et al., 2001 argues that there is a mixed view as whether GSCM practices causes or relates to positive or negative to economic performance. However, Alvarez et al. (2001) points out that there is a positive relationship with an organizational economic performance.

The competitive priorities literature (Ferdows and De meyer, 1990; Ward et al., 1998) offers a useful approach in measuring operational performance. Skinner (1974) explains the idea has its root in the trade-off approach whereby a manufacturing operation cannot perform in all dimensions and has to define priorities .The most basic competitive priorities are cost, quality, flexibility and delivery (Boyer and lewis, 2002; ward et al., 1998).Snyder and war (1990) further introduces fifth priority: innovativeness. Cooper et al. (1997) suggests measurement models are divided into four categories: cost, a combination of cost and customer responsiveness, activity time, and flexibility.

Heizer et al. (2008) refers operational performance as the ability of a company in reducing management costs, order-time lead time, improving effectiveness of using raw materials and distribution capacity. Therefore it's important to an industry as it helps to improve effectiveness of production Supply chain is important aspect in organization and consequently the green supply chain management has emerged as a vital component of the environmental and supply chain strategies of a large number of companies.

Gupta (1994) argues that the term greening has an ambiguous meaning in various fields. The term indicates not only harmonizing corporate environment performance with stock holders' expectations but also developing a critical new source of competitive advantage in terms of management perspective. He further argues environmental management relieves environmental destruction and improves environmental performance by institutionalizing various greening practices and initiating new measures and developing technologies, processes and products. GSCM has emerged as an effective management tool and philosophy for proactive and leading manufacturing organizations.

The scope of green supply chain management practices implementation ranges from green purchasing to integrated life- cycle management supply chain flowing from suppliers through to manufacturer, customer and closing the loop with reverse logistics. However, the boundary of GSCM is dependent on the researcher's goals and the problems at hand (Lai et al., 2004).

Francoise (2010) conducted an analysis of green supply chain management as marketing tool versus revolution and found that firms trying to become greener gain more visibility, credibility and enhanced their leadership reputation. Other factors like employees retention were less significant to going green but a defined sustainability strategy will help in attracting top talent for hire. Various studies have been brought forward in manufacturing industries concerning GSCM practices. However, none has discussed on GSCM practices and performance in alcoholic beverage manufacturers in Kenya.

2.5 Summary of the Literature Reviews and Knowledge Gaps

The literature reviews have elaborated in details the GSCM practices as well as the various studies done in the area of GSCM. Benefits of subscribing to the GSCM practices

are also mentioned. They indicate that there is a positive relationship between GSCM practices and performance of firms e.g. supply chain performance, economic and environmental performance. A study done by Rha (2010) focused on manufacturing firms where he recommends research on the same should be done and other practices should be included and also in different firms. The literature review through theories explains the relationships between GSCM practices and the firms' performance. They also portray various benefits a firm acquires by subscribing to GSCM.

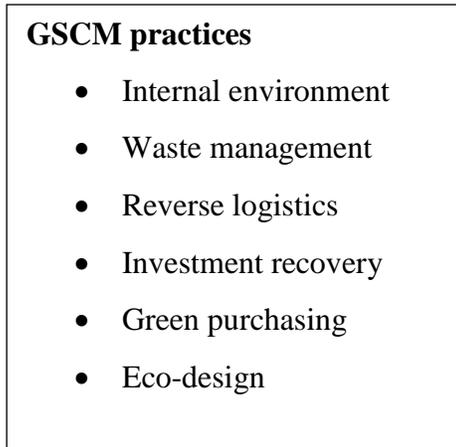
Lack of universally accepted framework on what to consider and what not to consider in operational performance is yet another challenge. It has also clearly indicated that there is a lack of one –way or universally acceptable framework on the GSCM practices. Consequently, organizations adopt different practices that suit their organizational needs. In this regard, the GSCM practices and its impact on performance of a firm are determined. The literature review gives us knowledge of the GSCM practices and its implications on performance of firms. The question we asked ourselves was if there were changes in operational performance in the alcoholic beverage manufacturers in Kenya if GSCM practices are adopted? Were environmental and economic benefits associated with the GSCM practices applicable in our case?

2.6 Conceptual Model

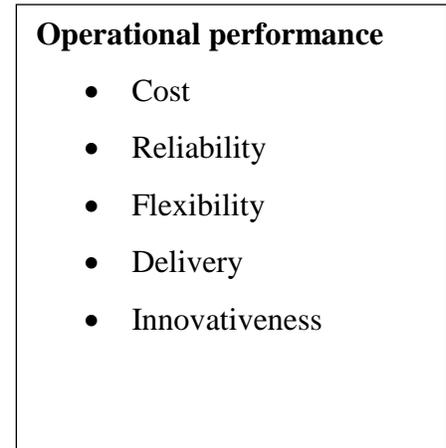
The study used GSCM practices as independent variables and the operational performance as dependent variables this was in a bid to determine the effect of adoption of Green Supply Chain management on operational performance as per objective two of this study. This is shown in Figure 2.1 below.

Figure2.1: Conceptual Model Linking GSCM Practices and Supply Chain Performance

Independent variables



Dependent variables



Source: Researcher (2015)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the methodology that was used to obtain the objectives of the study. The chapter discusses; research design, data collection and analysis. This was in a bid to map out the direction of the study.

3.2 Research Design

This research adopted a descriptive survey study where the researcher sought to determine green supply chain management practices and its effect on operational performance adopted by alcoholic beverage manufacturers in Kenya. Survey design was used to collect data from the population in order to determine current status of the population which was the aim of the research.

3.3 Population

The population of study consisted of 41 registered alcoholic beverage manufacturers operating in Kenya. A census was done because the population was small.

3.4 Data Collection

The study sought to collect primary data. The data collected from respondents was both qualitative and quantities. Questionnaire method was used to collect the data.

The questionnaire had three parts as follows:

Part A: Bio-data

Part B: Green Supply Management Practices

Part C: Operational Performances

Respondents were 41 operations managers of the various alcoholic beverage manufacturers in Kenya. The questionnaires were administered to the respondents personally to shorten the response time and enable on-the spot clarification of any doubts that the respondents may have had regarding any questions. This gave the researcher a chance to introduce the topic and motivate respondents to give their honest contributions. However, for respondents who had time constraints questionnaires were dropped and picked later after self-administration. Others were emailed to the senior operations managers depending on the accessibility and time available. The data was then consolidated and packed for analysis.

3.5 Data Analysis

The data collected in the questionnaires was checked for completeness and consistency. It was then edited and coded for entry into a computer for analysis. The data was then analyzed using descriptive statistics where, percentage, mean and standard deviation was used for easy understanding and interpretation hence drawing conclusion on the findings. Tables, graphs and figures were used to determine GSCM practices and its operational performance adopted by alcoholic beverage manufacturers in Kenya as per objective one and to determine supply chain operational performance as per objective 2 of this paper. In analyzing data for objective two, the regression analysis was used to determine the effects of adoption of Green Supply Chain management on operational performance of alcoholic beverage manufacturers in Kenya. The regression model used is given below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

Where: Y = Operational Performance

X₁ = Internal environment

β₀ = Constant

X₂ = waste management

e = Error term

X₃ = Reverse logistics

X₄ = Investment recovery

X₅ = Green purchasing

X₆ = Eco-design

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The results of the research project exploring the GSCM practices adopted by the alcoholic beverage manufacturers in Kenya. The results of the analyses are presented per study objective and described in tables where stated. The study used a census to obtain 41 operational managers to respond questions. Once the respondents answered the questionnaire, data was then coded and analyzed using SPSS.

4.1.1 Response Rate

The study targeted 41 respondents in collecting data with regard to GSCM practices and performance of the alcoholic beverage manufacturers in Kenya. From the study, 38 respondents out of the 41 responded, making a response rate of 92.7%. According to Mugenda and Mugenda (2003) a 50% response rate is adequate, 60% good and above 70% rated very Good. This also concurs with Kothari (2004) assertion that a response rate of 50% is adequate, while a response rate greater than 70% is very good. This implies that based on this assertions; the response rate in this case of 92.7 % is very good. This is shown in Table 4.1.

Table 4.1: Response rate

Response	Frequency	Percentage
Responded	38	92.7
Not responded	3	7.3
Total	41	100

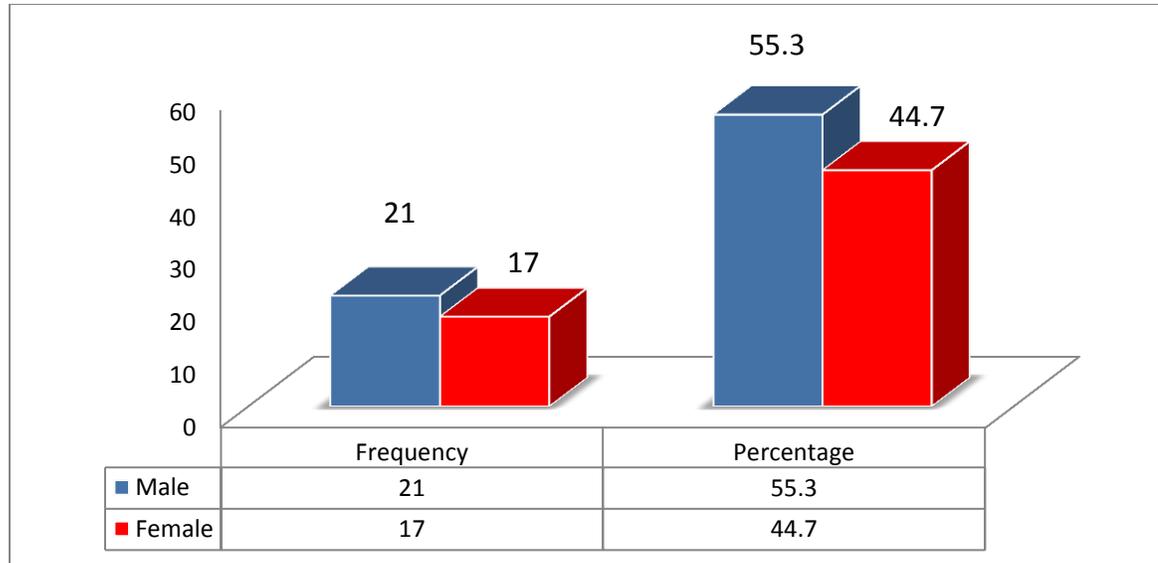
Source: Research Data (2015)

4.2 General Information

4.2.1 Gender of Respondents

The study sought to find out the respondents gender. According to the study majority were males and the minority were females as depicted in Figure 4.1.

Figure4.1: Gender of the respondents



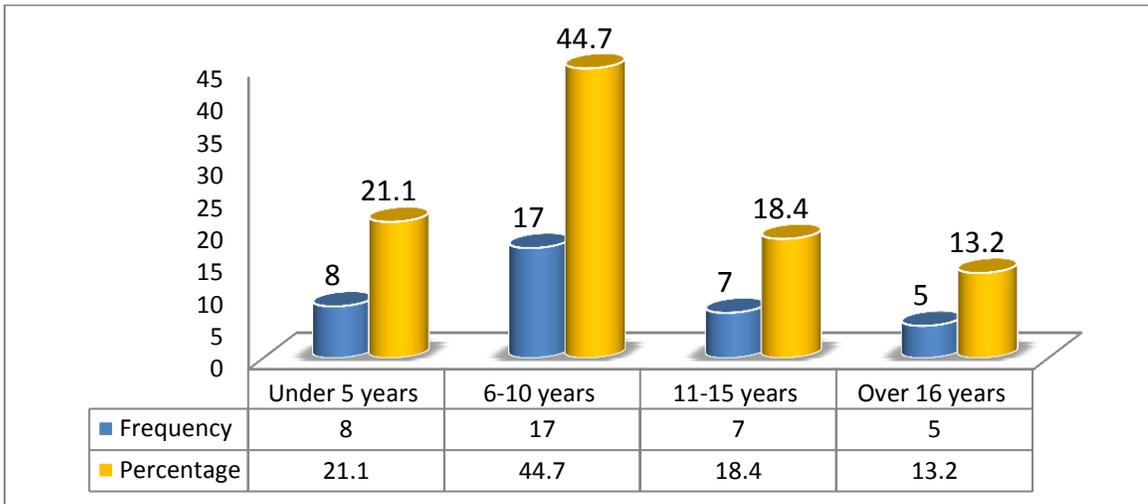
Source: Research data (2015)

According to the analysis of the findings a majority (55.3%) were males as opposed to their female counterparts who accounted for 44.7%. Therefore the analysis of the findings reveals that most people who were interviewed were male.

4.2.2 Years of Manufacturer in operation

The study sought to establish the number of years of the manufacturer in operation. The findings of the study revealed that most (44.7%) have operated for 6-10 years. In addition, the findings of the study shows that 18.4% said 11-15 years, 21.1% indicated less than 5 years and the remaining 13.2 said over 16 years. It therefore depicted that most manufacturers have operated for 6-10 years as shown in Figure 4.2.

Figure4.2: Years of manufacturer in Operation

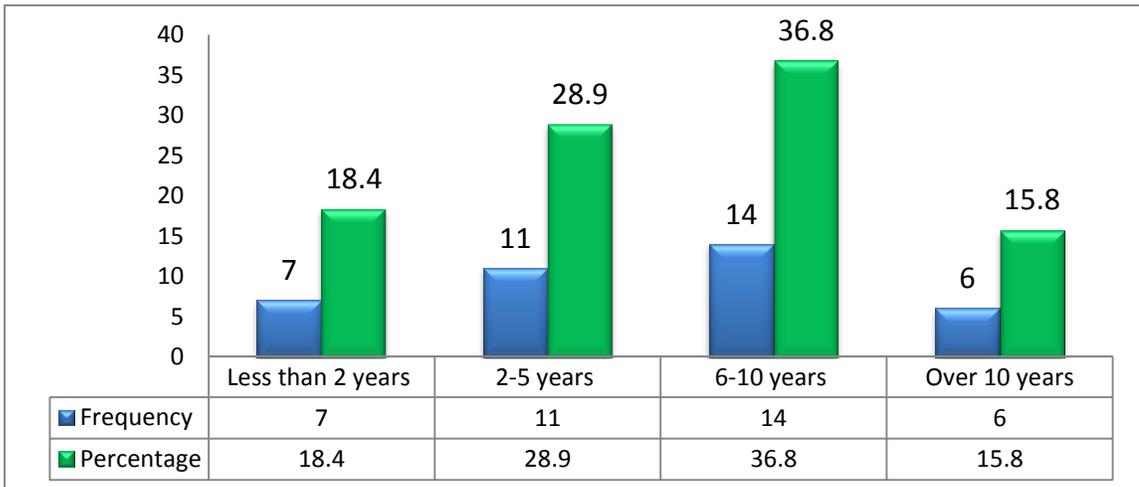


Source: Research Data (2015)

4.2.3 Years worked in the firm

The researcher asked the respondents to indicate the number of years worked in the firms. According to the analysis of the findings, a majority (36.8%) indicated 6-10 years followed by 28.9% who indicated 2-5 years. Further, it was revealed that 18.4% indicated less than 2 years and the remaining 15.8 said over 10 years. From the analysis of the findings, it can be concluded that most people have worked for 6-10 years as depicted in Figure 4.3.

Figure4.3: Years worked in the firm

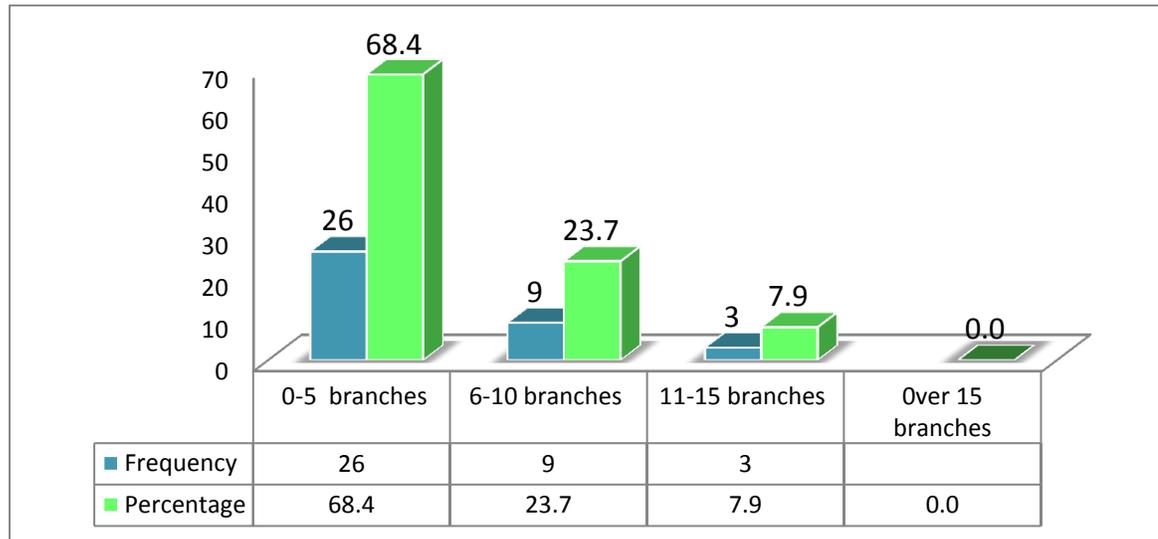


Source: Research Data (2015)

4.2.4 Number of Branches in Kenya

The study also sought to establish the number of branches in Kenya for the manufacturer. Based on the analysis of the findings a majority (68.4%) indicated 0-5 branches. Further, it was revealed that 23.7% indicated 6-10 branches, 7.9% indicated 11-15 branches and above 15 branches had none. It can be depicted that most firms had less than 5 branches as shown in Figure 4.4.

Figure 4.4: Numbers of Branches in Kenya

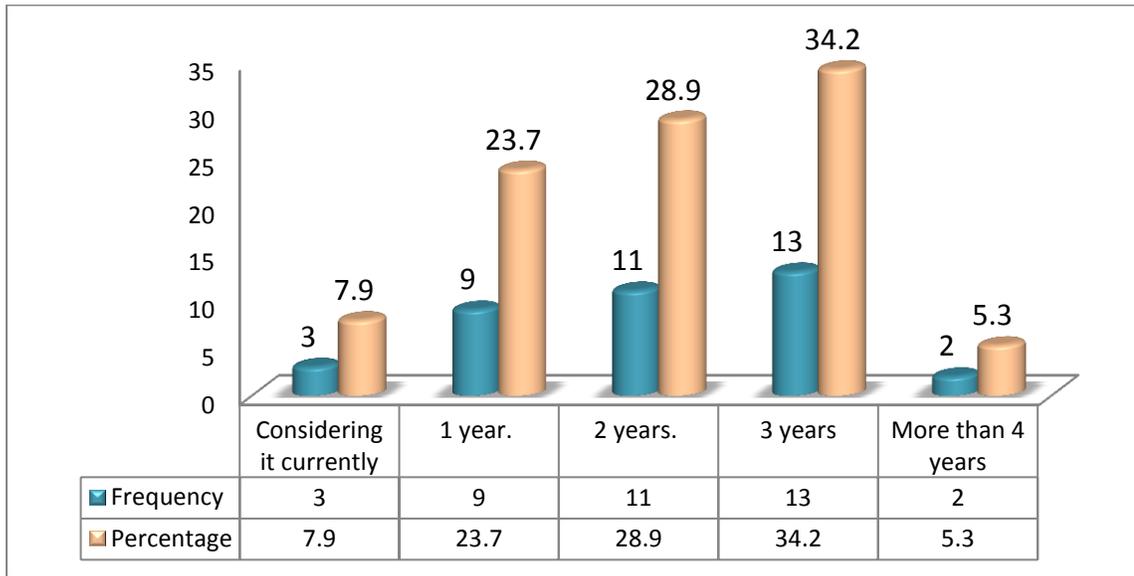


Source: Research Data (2015)

4.2.5 Green Supply Chain Management Practices (GSCM)

The study also asked respondents to indicate the duration the firm has established GSCM. Based on the findings of the study a majority (34.2%) indicated 3 years followed by 28.9% who indicated 2 years, 23.7% indicated 1 year. It was further realized that 5.3% indicated more than 4 years and the remaining 7.9% were considering it. Therefore most firms have adopted GSCM for 3 years as shown in Figure 4.5.

Figure4.5: Duration the firm has established GSCM



Source: Research Data (2015)

4.3 Green Supply Chain Management Practices (GSCM)

4.3.1 Internal environment

The study set to establish the extent to which the organization has been practicing the green supply chain management in the internal environment. This is presented in Table 4.2.

Table4.2: Extent to which the organization has been practicing the green supply chain management in internal environment

Internal environment	Mean	Standard Deviation
The manufacturers information is shared with the environmental practitioners	3.85	0.581
The middle level managers are committed in environmental practices	3.82	0.910
Senior managers supports mid-level managers for successful environmental practices	3.53	0.734
There is existence of cross- functional GSCM	3.42	0.669

Source: Research Data (2015)

Those who indicated to a large extent said that the manufacturers information is shared with the environmental practitioners (M=3.85, SD=0.581), the middle level managers are committed in environmental practices M=3.82, SD=0.910), and on that senior managers supports mid-level managers for successful environmental practices (M=3.53, SD=0.734). Those who indicated to a moderate extent said that there is existence of cross- functional GSCM (M=3.42, SD=0.669). The findings conclude that most firms interviewed practiced GSCM in the internal environment.

4.3.2 Waste management

The study set to know the extent to which the organization has been practicing the green supply chain management in waste management. The results are presented in Table 4.3.

Table4.3: Extent to which the organization has been practicing the green supply chain management in waste management

Waste management	Mean	Standard Deviation
The manufacturer employs lean production and total quality management in its operations	3.77	0.841
The manufacturer uses biodegradable materials	3.63	0.605
The manufacture purchases eco- design products for reduced consumption of materials/energy	3.41	0.552
The manufacturer has invested on hazardous disposal equipment	3.15	0.860

Source: Research Data (2015)

Those who indicated large extent on the statements said that the manufacturer employs lean production and total quality management in its operations (M=3.77, SD=0.841) and the manufacturer uses biodegradable materials (M=3.63, SD=0.605). Further, the study revealed that those who indicated moderate extent said that the manufacturer purchases eco- design products for reduced consumption of materials/energy (M=3.41, SD=0.552) and the manufacturer has invested in hazardous disposal equipment (M=3.15, SD=0.860). The findings of the study reveal that majority of organizations practice green supply chain management in waste management.

4.3.3 Reverse logistics

The study sought to establish the extent to which the organization has been practicing the green supply chain management in reverse logistics. The results are presented in Table 4.4.

Table4.4: Extent to which the organization has been practicing the green supply chain practices in reverse logistics

Reverse logistics	Mean	Standard Deviation
The manufacturer manages reverse flow of material, environment packaging and distribution	4.18	0.502
Assuring proper utilization of materials by customers	3.93	0.772
The manufacturer controls environmental risk associated with suppliers operations.	3.71	0.692
The manufacturer has invested in technology for waste management	3.57	0.882

Source: Research Data (2015)

From the findings of the study, those who indicated large extent said that the manufacturer manages reverse flow of material, environment packaging and distribution (M=4.18, SD=0.502), assuring proper utilization of materials by customers (M=3.93, SD=0.772), the manufacturer controls environmental risk associated with suppliers operations (M=3.71, SD=0.692) and that the manufacturer has invested in technology for waste management (M=3.57, SD=0.882). Therefore, it can be concluded that a majority of the respondents indicated their respectful organization practice green supply chain practices in reverse logistics to a large extent.

4.3.4 Investment recovery

The study further sought to find out the extent to which the organization has been practicing the green supply chain management in investment recovery. The results are presented in Table 4.5.

Table4.5: Extent to which the organization has been practicing the green supply chain practices in investment recovery

Investment recovery	Mean	Standard Deviation
The manufacturer engage in waste recovery	4.16	0.594
The manufacturer brand is enhanced through investment recovery	3.82	0.835
The manufacturer engage in material recovery	3.60	0.871

Source: Research Data (2015)

Those who indicated large extent said that the manufacturer engage in waste recovery (M=4.16, SD= 0.594), the manufacturer brand is enhanced through investment recovery (M=3.82, SD=0.835) and on the manufacturer engaging in material recovery (M=3.60, SD=0.871). Therefore the findings of the study conclude that a majority said that their organizations have been practicing the green supply chain practices in investment recovery.

4.3.5 Green Purchasing

Regarding on the extent to which the organization has been practicing green supply chain management, the results are presented in Table 4.6.

Table4.6: Extent to which the organization has been practicing the green supply chain management in green purchasing

Green Purchasing	Mean	Standard Deviation
The manufacturer considers the environmental impact of product at all stages of its life cycle	4.03	0.693
The manufacturer assesses suppliers environmental management and activities	3.75	0.871
The alcohol beverage manufacturer includes GSCM strategies in its strategic planning process	3.52	0.695

Source: Research Data (2015)

Those who indicated large extent said the manufacturer considers the environmental impact of product at all stages of its life cycle (M=4.03, SD=0.693),the manufacturer assesses suppliers environmental management and activities (M=3.75, SD=0.871) and that the alcohol beverage manufacturer includes GSCM strategies in its strategic planning process (M=3.52, SD=0.695). Therefore it can be depicted that most alcoholic beverage manufacturers in Kenya have been practicing the green supply chain management.

4.3.6 Eco-design

Regarding the extent to which the organization has been practicing the green supply chain management in eco-design. The results are presented in Table 4.7

Table4.7: Extent to which the organization has been practicing the green supply chain practices in eco-design

Eco-design	Mean	Standard Deviation
You have cooperation with suppliers for green packaging	4.17	0.746
You have cooperation with suppliers for environmental objectives	3.59	0.996
The manufacturer provides design specifications to suppliers that includes environmental requirements when purchasing an item	3.04	0.682

Source: Research Data (2015)

Those who indicated large extent said that they have cooperated with suppliers for green packaging (M=4.17, SD=0.746) and that they have cooperated with suppliers for environmental objectives (M=3.59, SD=0.996). In addition, those who indicated to a moderate extent said that the manufacturer provides design specifications to suppliers that includes environmental requirements when purchasing an item (M=3.04, SD=0.682). It can be concluded that a majority indicated that the interviewed firms practiced green supply chain management in eco-design to a large extent.

4.4Summary of the GSCM practices

Summary of the GSCM practices indicating extent to which the organizations have adopted GSCM is given by Table 4.8.

Table4.8: Summary of the GSCM practices

	Mean	Standard Deviation
Internal Environment	3.655	0.7235
Waste management	3.49	0.7145
Reverse Logistics	3.8475	0.712
Investment recovery	3.86	0.77
Green Purchasing	3.77	0.753
Eco-design	3.6	0.808

Source: Research Data (2015)

Investment recovery had highest average mean and average standard deviation of (M=3.86, SD=0.77) followed by Reverse logistics (M=3.8475, SD=0.712), Green purchasing, (M=3.77, SD=0.753), Internal environment (M=3.655, SD=0.7235), Eco-design (M=3.6, SD=0.808) and waste management (M=3.49 SD=0.7145) respectively.

Therefore all the GSCM practices mean and their standard deviation were adequate hence had large extent relationship with GSCM. As a result, they were used to determine the effect of GSCM practices on operational performance. Other study by Chege (2012) GSCM practices and supply chain performance of private hospitals in Nairobi, Kenya, average mean and average standard deviation are almost at the same range with this research findings of the same.

4.5 Green Supply Chain management practices and operational Performance

The main objective of this study was to rate various parameters of GSCM practices with different operational performance.

4.5.1 GSCM Practices with regards to Cost

The study aimed at knowing the respondents level of rate of GSCM practices with regards to cost. The results are presented in Table 4.9.

Table4.9: GSCM Practices with regards to Cost

Cost	Mean	Standard Deviation
Green purchasing reducing sources of wastes	4.01	0.762
Scrap are sold to recyclers hence adds profits to the firm	3.96	0.773
Eco-designed products reduces costs of sickness to customers	3.85	0.626
Capturing materials and wastes reduces costs	3.62	0.931
Lower hazardous materials management and reporting	3.61	0.723
Saving energy	3.58	0.662
Customers are happy by existence of warrants	3.20	0.872
Information sharing with environmental professionals reduces legal suits	3.17	0.991

Source: Research Data (2015)

Those who indicated very good said that green purchasing reduces sources of wastes(M=4.01, SD=0.762),saves energy (M=3.58, SD=0.662),lowers hazardous materials management and reporting (M=3.61,SD=0.723),eco-designed products reduces costs of sickness to customers(M=3.85,SD=0.626),capturing materials and wastes reduces costs(M=3.62,SD=0.931), and scrap are sold to recyclers hence adds profits to the firm(M=3.96,SD=0.773). In addition, those who indicated Good said that information sharing with environmental professionals reduces legal suits (M=3.17, SD=0.991)and customers are happy by existence of warrants (M=3.20, SD=0.872). Therefore, it can be concluded that a majority of respondents indicated very good.

4.5.2 GSCM Practices with regards to Reliability

The study aimed at knowing the respondents level of rate of GSCM practices with regards to reliability. The results are presented in Table 4.10.

Table4.10: GSCM Practices with regards to Reliability

Reliability	Mean	Standard Deviation
The manufacturers' time for order process is short	4.82	0.883
The manufacturer ensures timely delivery of materials	3.85	0.629
Manufacturer ensures reliability in packaging	3.70	0.692
The manufacturer is flexible in ordering materials	3.32	0.762

Source: Research Data (2015)

Those who indicated excellent said that the manufacturers' time for order process is short (M=4.82, SD=0.883). Those who indicated very Good explained that the manufacturer ensures timely delivery of materials (M=3.85, SD=0.629) and manufacturer ensures reliability in packaging (M=3.70, SD=0.692). Further, those who indicated Good said that the manufacturer is flexible in ordering materials (M=3.32, SD=0.762). Therefore, a majority of the respondents indicated very Good on GSCM practices with regards to reliability.

4.5.3 GSCM Practices with regards to Flexibility

The study aimed at knowing the respondents level of rate with GSCM practices with regards to flexibility. The results are presented in Table 4.11.

Table4.11: GSCM Practices with regards to Flexibility

Flexibility	Mean	Standard Deviation
The manufacturer seeks advices from environmentalist on the product and processing methods	3.97	0.503
The manufacturer has diversified in different products	3.90	0.693
The manufacturer sources from different suppliers who best adhere to environmental considerations	3.52	0.885
The manufacturer offers different alternatives for the waste i.e. recycling or proper disposal	2.92	0.665

Source: Research Data (2015)

Those who indicated very Good said the manufacturer seeks advices from environmentalist on the product and processing methods (M=3.97, SD=0.503),the manufacturer has diversified in different products (M=3.90, SD=0.693) and the manufacturer sources from different suppliers who best adhere to environmental considerations (M=3.52, SD=0.885). In addition, those indicated good indicated that the manufacturer offers different alternatives for the waste i.e. recycling or proper disposal (M=2.92, SD=0.665). It can be concluded that a majority of the respondents indicated very good.

4.5.4 GSCM Practices with regards to Delivery

The study aimed at knowing the respondents level of rate with GSCM practices with regards to delivery. The results are presented in Table 4.12.

Table4.12: GSCM Practices with regards to Delivery

Delivery	Mean	Standard
Insurance of timeliness in delivery e.g. accelerate test process by NAKADA,KEBS etc.	4.85	0.943
Green purchase ensures evaluation of products during delivery	4.60	0.592
Timeliness in delivery enables manufacturer to reduce waste and expiry of products which leads to health and regulation issues	4.44	0.560
The manufacturer has improved on visibility through reverse logistics	3.76	0.696

Source: Research Data (2015)

Those who indicated excellent said that green purchase ensures evaluation of products during delivery (M=4.60, SD=0.592) and insurance of timeliness in delivery e.g. accelerate test process by NACADA, KEBS etc. (M=4.85, SD=0.943). Those who indicated very Good said that timeliness in delivery enables manufacturer to reduce waste and expiry of products which leads to health and regulation issues (M=4.44, SD=0.560) and the manufacturer has improved on visibility through reverse logistics (M=3.76, SD=0.696). Based on study findings, a majority indicated very Good to GSCM practices with regards to delivery.

4.5.5 GSCM Practices with regards to Innovativeness

The study aimed at knowing the respondents level of rate with GSCM practices with regards to innovativeness. The results are presented in Table 4.13.

Table4.13: GSCM Practices with regards to Innovativeness

Innovativeness	Mean	Standard Deviation
The senior managers' supports and rewards new ideas of green issues by mid-level managers	3.86	0.703
The manufacturer use technology to ensure waste management and recovery	3.71	0.773

Source: Research Data (2015)

Those who indicated very good said the manufacturer use technology to ensure waste management and recovery (M=3.71, SD=0.773) and the senior managers' support and rewards new ideas of green issues by mid-level managers (M=3.86, SD=0.703). Based on study findings, a majority indicated very Good to GSCM practices with regards to innovativeness.

4.6 Regression analysis

The researcher conducted multiple linear regression analysis to establish the relationship between GSCM practices and operational performance. This was through the application of the statistical software for social sciences (SPSS version21.0).The results are presented in Table 4.14 below.

Table4.14: Multiple Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.253	.560		7.723	0.000
	Internal environment	0.886	0.395	0.495	0.165	0.004
	waste management	0.876	0.469	0.351	0.119	0.003
	Reverse logistics	0.798	0.562	0.323	0.111	0.003
	Investment recovery	0.619	0.383	0.359	0.103	0.000
	Green purchasing	0.511	0.179	0.997	0.298	0.001
	Eco-design	0.458	0.266	0.343	0.243	0.001

Source: Research Data (2015)

From the result the sample multiple linear regression model of operational performance on GSCM was obtained as follows:

$$Y = 3.253 + 0.886X_1 + 0.876X_2 + 0.798X_3 + 0.619X_4 + 0.511X_5 + 0.458X_6 + \varepsilon$$

Where Y is the dependent variable (operational performance of alcoholic beverage manufacturers in Kenya), X_1 is internal environment variable, X_2 is waste management variable, X_3 is Reverse logistics variable, X_4 is investment recovery variable, X_5 is green purchasing variable and X_6 is eco-design variable.

Using the p-values, the coefficients for all the predictors in the model are significant since the respective p-values are less than 0.05.

Using the t-values, the t-values for all the predictors in the model are more or less approximately the same. This relates well with the p-values. This relates well with the p-values.

From the table, we can observe that the organizations have implemented internal environment practices at a significantly higher level than the other GSCM practices. This matches the findings by zhu et al. (2005) who found most of that organizations in china prioritize internal environment more than other GSCM practices. However; Chege(2012) had contrasting findings whereby she indicated waste management at significantly higher levels than the other GSCM practices. In conclusion therefore, all the predictors used in the model are significant and can be used for the estimation of operational performance

4.7 Coefficient of Determination, R^2

The coefficient of determination determines in a regression model that portion of the dependent variable which is explained by the predictors in the model. Generally the higher the value of R^2 the larger the proportion of the dependent variable that is being explained by the predictors in the model and hence the more reliable the model is for prediction purposes. A regression model is termed adequate when R^2 is 70% or more. The findings are presented in Table 4.15 below.

Table4.15: Coefficient of Determination, R^2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877a	.865	.607	.2443

Source: Research Data (2015)

The results indicate that 86.5% variation in operational performance is explained by GSCM practices and only about 13.5% other factors not in the model. This model is

adequate and may be used for the estimation of operational performance based on GSCM.

4.8 Analysis of Variance (ANOVA)

ANOVA provides statistical techniques which are used for testing the significance of a regression model. The results from ANOVA are presented in Table 4.16 as shown below.

Table4.16: Analysis of Variance (ANOVA)

	Sum of				
	Squares	df	Mean Square	F	Sig.
Regression	.852	3	.213	1.242	.000
Residual	20.35	38	.171		
Total	22.64	41			

Source: Research Data (2015)

Considering the results,

Using the p-value, the model is statistical significant since the p-value is less than 0.05

Using the F statistic, the critical F test statistic (tabulated) at $\alpha=0.05$ with degrees of freedom in the numerator, $df = K-1=7-1=6$ and degrees of freedom in the denominator, $df = n-k=42-7=35$, is $F_c = 1.134$.

It is evident from this result that the regression model is significant since $1.842 > 1.134$.

This is compatible with the p-value.

4.9 Discussion of findings

The general objective of this study was to analyze the GSCM practices and performance of the alcoholic beverage manufacturers in Kenya. To larger extent, the study found that various alcoholic manufacturers had adopted the GSCM practices as per objective one of this study. In this vein likert questions were set in the questionnaire so as to establish the extent to which the organization has practiced the green supply chain management in internal environment. Most respondents indicate to a large extent by saying that

manufacturers' information was shared with the environmental practitioners; middle level managers were committed in environmental practices, and senior managers support mid-level managers for successful environmental practices. This is in collaboration with most Organizations in china whose internal environment practices have been prioritized (Zhu et al., 2005).

On the extent to which the organization has been practicing the green supply chain management practices in waste management, most respondents indicated to large extent by stating that the manufacturer employs lean production and total quality management in its operations and the manufacturer uses biodegradable materials. The findings can be compared to those of Chege (2012) who found out that waste management was the most prioritized practice in the Nairobi private hospitals.

Again, on the extent to which the organization has been practicing the green supply chain practices in reverse logistics, the respondents said that the manufacturer manages reverse flow of material, environment packaging and distribution, assuring proper utilization of materials by customers, the manufacturer controls environmental risk associated with suppliers operations and that the manufacturer has invested in technology for waste management. This finding is consistent with Helms and Hervanni (2006), who found that reverse logistics activities in the carpet industry resulted in added value because it was less detrimental to the environment.

It also found it important to establish the extent to which the organization has been practicing the green supply chain practices in investment recovery. Those indicated large extent said that the manufacturer engage in waste recovery, the manufacturer brand is enhanced through investment recovery and on the manufacture engaging in material recovery.

Further, with regard to green purchasing most respondents indicated that the manufacturer considered the environmental impact of product at all stages of its life cycle, the manufacturer assessed suppliers' environmental management and activities and that the alcohol beverage manufacturer included GSCM strategies in its strategic planning process.

The study sought to establish the extent to which the organization has been practicing the green supply chain practices in eco-design. The findings of the study revealed that the firms have cooperated with suppliers for green packaging and with suppliers for environmental objectives. The research concluded there is a positive relationship between eco-design and the operation performance. However, Zhu et al. (2007) reported that firms that adopt green purchasing and eco-design practices will achieve better environmental performance compared to firms that implement other green initiatives, but that eco-design practices lead to a decrease in organizational performance.

The second objective of the study was to determine the effect of adoption of GSCM on operational performance. GSCM with regards to cost majority of the respondents indicated that very good this meant that green purchasing reduces sources of wastes ($M=4.01$, $SD=0.762$), saves energy ($M=3.58$, $SD=0.662$), lowers hazardous materials management and reporting ($M=3.61$, $SD=0.723$), eco-designed products reduces costs of sickness to customers ($M=3.85$, $SD=0.626$), capturing materials and wastes reduces costs ($M=3.62$, $SD=0.931$), and scrap are sold to recyclers hence adds profits to the firm ($M=3.96$, $SD=0.773$). In addition, those who indicated Good said that information sharing with environmental professionals reduces legal suits ($M=3.17$, $SD=0.991$) and customers are happy by existence of warrants ($M=3.20$, $SD=0.872$). However, this is in contrast with Eltayeb et al. (2010) who found that reverse logistics were significant only in terms of cost reduction, while green purchasing was not found to have a significant effect on any of the outcomes measured.

With reliability, those who indicated excellent said that the manufacturers' time for order process is short ($M=4.82$, $SD=0.883$). Those who indicated very Good explained that the manufacturer ensures timely delivery of materials ($M=3.85$, $SD=0.629$) and manufacturer ensures reliability in packaging ($M=3.70$, $SD=0.692$). Further, those who indicated Good said that the manufacturer is flexible in ordering materials ($M=3.32$, $SD=0.762$). Therefore, a majority of the respondents indicated very Good on GSCM practices with regards to reliability.

With regards to flexibility, those who indicated very Good said the manufacturer seeks advices from environmentalist on the product and processing methods (M=3.97, SD=0.503), the manufacturer has diversified in different products (M=3.90, SD=0.693) and the manufacturer sources from different suppliers who best adhere to environmental considerations (M=3.52, SD=0.885). In addition, those indicated good indicated that the manufacturer offers different alternatives for the waste i.e. recycling or proper disposal (M=2.92, SD=0.665). It can be concluded that a majority of the respondents indicated very good. Those who indicated excellent said that green purchase ensures evaluation of products during delivery (M=4.60, SD=0.592) and insurance of timeliness in delivery e.g. accelerate test process by NACADA, KEBS etc. (M=4.85, SD=0.943).

Concerning GSCM and delivery, those who indicated very Good said that timeliness in delivery enables manufacturer to reduce waste and expiry of products which leads to health and regulation issues (M=4.44, SD=0.560) and the manufacturer has improved on visibility through reverse logistics (M=3.76, SD= 0.696). Based on study findings, a majority indicated very Good to GSCM practices with regards to delivery.

Finally, GSCM with regards to innovativeness, those who indicated very good said the manufacturer use technology to ensure waste management and recovery (M=3.71, SD=0.773) and the senior managers' support and rewards new ideas of green issues by mid-level managers (M=3.86, SD=0.703). Based on study findings, a majority indicated very Good to GSCM practices with regards to innovativeness. The findings are in agreement with Ninlawan et al (2010) who argued that green manufacturing can lead to lower costs, production efficiency gains, reduced environmental and occupational safety expenses and improved corporate image. Ninlawan et al (2010) also maintained that packaging characteristics such as size, shape, and materials have impact on distribution because of their effect on the transport characteristics of the product.

The researcher conducted multiple linear regression analysis to establish the relationship between GSCM practices and operational performance. Multiple linear regression model of operational performance on GSCM was obtained as follows: $Y = 3.253 + 0.886X_1 + 0.876X_2 + 0.798X_3 + 0.619X_4 + 0.511X_5 + 0.458X_6 + \varepsilon$. Where Y is the dependent variable

(operational performance of alcoholic beverage manufacturers in Kenya), X_1 is internal environment variable, X_2 is waste management variable, X_3 is Reverse logistics variable, X_4 is investment recovery variable, X_5 is green purchasing variable and X_6 is eco-design variable. The findings support the findings by Wilkerson (2005), Mazumber (2010) and Murray (2011) who concluded that green supply chain activities provide an opportunity to review processes, materials, and occupational concepts. It targets wasted materials, wasted energy or effort and under-utilized resources.

Using the p-values, the coefficients for all the predictors in the model were significant since the respective p-values are less than 0.05. The coefficient of determination (R^2) was 0.865 hence supports the GSCM practices positive relationship on operational performance of alcoholic beverage manufacturers in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary of the findings and conclusions. It also gives the recommendations, limitations and suggestions for further research.

5.2 Summary of Findings

The main objective of this study was to analyze the GSCM practices adopted by the alcoholic beverage manufacturers in Kenya. In this vein likert questions were set in the questionnaire so as to establish the extent to which the organization has practiced the green supply chain management in internal environment. Most respondents indicate to a large extent by saying that manufacturers' information was shared with the environmental practitioners; middle level managers were committed in environmental practices, and senior managers support mid-level managers for successful environmental practices.

On the extent to which the organization has been practicing the green supply chain management practices in waste management, most respondents indicated to large extent by stating that the manufacturer employs lean production and total quality management in its operations and the manufacturer uses biodegradable materials.

Again, on the extent to which the organization has been practicing the green supply chain practices in reverse logistics, the respondents said that the manufacturer manages reverse flow of material, environment packaging and distribution, assuring proper utilization of materials by customers, the manufacturer controls environmental risk associated with suppliers operations and that the manufacturer has invested in technology for waste management.

It also found it important to establish the extent to which the organization has been practicing the green supply chain practices in investment recovery. Those indicated large

extent said that the manufacturer engage in waste recovery, the manufacturer brand is enhanced through investment recovery and on the manufacture engaging in material recovery.

Further, with regard to green purchasing most respondents indicated that the manufacturer considered the environmental impact of product at all stages of its life cycle, the manufacturer assessed suppliers' environmental management and activities and that the alcohol beverage manufacturer included GSCM strategies in its strategic planning process.

Finally the study sought to establish the extent to which the organization has been practicing the green supply chain practices in eco-design. The findings of the study revealed that the firms have cooperated with suppliers for green packaging and with suppliers for environmental objectives.

5.3 Conclusion

The research concluded there is a positive relationship between GSCM practices and the operation performance in alcohol beverage manufacturers in Kenya.

5.4 Recommendations

Based on the findings of this study, it is recommended that the implementation of GSCM should be implemented among alcoholic beverage manufacturers in Kenya because there are benefits that accrue from such implementation. For instance, firms will benefit through improvement in increased use of recyclable materials, savings on costs due to effective utilization of available productive resources, reduction of the environmental impact of business processes and reduction of operational costs and risk of prosecution based on anti-environment reasons.

The strategies that should make GSCM attractive to firms should focus on internal environment which had the most significant influence on the percentage of costs expended on GSCM. However, focusing on Eco-design may not produce much influence

on the success of implementation of GSCM among the alcoholic beverage manufacturers in Kenya.

5.5 Limitations of the Study

The research met with various challenges when conducting the research that included the fact that the firms ordinarily do not want to give information due to client confidentiality. The findings of the study may not be generalizable to other manufacturing firms in Kenya to differences in social, political and economic environments in different parts of the country. In addition, some of the respondents would not find the subject to be of interest. Additionally, some respondents would not want to give the information as they considered it of competitive importance. Time limitation made it impractical to include more respondents in the study. This study was also limited by other factors in that some respondents may have been biased or dishonest in their answers. More respondents would have been essential to increase the representation of manufacturers in this study and to allow for better check of consistency of the information given. However, the researcher did look for contradictions in the information given and no inconsistency were found.

5.6 Suggestions for Further Research

The study has determined the various green supply chain management practices and their effect on supply chain performance in alcoholic beverage manufacturers in Kenya registered by NACADA. However, the alcoholic beverage manufacturers in Kenya are also comprised of traditional manufacturers who differ in their way of management and have different settings all together. Again, not all alcoholic beverage manufactures especially of second generation have been included in the study this is due to the current existing disharmony between NACADA, KEBS and KRA. This warrants the need for another study which would ensure generalization of the study findings for all the alcoholic beverage manufacturers in Kenya and hence pave way for new policies. The study therefore recommends further study to be carried out to investigate the factors influencing green supply chain management practices and their effect on supply chain operational performance in all alcoholic beverage manufacturers in Kenya.

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APPENDICES

APPENDIX I: RESEARCH QUESTIONNAIRE

This questionnaire is seeking answers from alcoholic beverage manufacturers in Kenya. The Information is intended for academic purposes only and will not be divulged to any other Person. Please complete all sections of this document. All questions are interrelated and are very important for the study.

PART A: BIO DATA

1. Name of the respondent (optional).....
2. Name of the alcoholic beverage manufacturer.....
3. Gender: Male [] Female []
4. How long has your firm being in operation?
 - a) Under 5 years []
 - b) 6-10 years []
 - c) 11-15 years []
 - d) Over 16 years []
5. How long have you worked in the firm?
 - a) Less than 2 years []
 - b) 2-5 years []
 - c) 6-10 years []
 - d) Over 10 years []

6. How many branches do you have in Kenya if any?

- a) 0-5
- b) 6-10
- c) 11-15
- d) Over 15

7. How long has your firm established GSCM?

- a) Considering it currently
- b) 1 year.
- c) 2 years.
- d) 3 years.
- e) More than 4 years

PART B: GREEN SUPPLY CHAIN MANAGEMENT PRACTICES (GSCM)

Please tick appropriately the extent to which your organization has been practicing the

Following green supply chain practices. (Use the scale to tick the most appropriate response)

5) Very large extent 4) large extent 3) Moderate extent 2) small extent 1) no extent

Internal environment	5	4	3	2	1
The middle level managers are committed in environmental practices					
Senior managers supports mid-level managers for successful environmental practices					
The manufacturers information is shared with the environmental practitioners					
There is existence of cross functional GSCM					
Waste management					
The manufacture purchases eco- design products for reduced					

consumption of materials/energy					
The manufacturer uses biodegradable materials					
The manufacturer has invested on hazardous disposal equipment					
The manufacturer employs lean production and total quality management in its operations					
Reverse logistics					
The manufacturer manages reverse flow of material, environment packaging and distribution					
The manufacturer controls environmental risk associated with suppliers operations					
Investment recovery					
The manufacturer engage in waste recovery					
The manufacture engage in material recovery					
The manufacturer brand is enhanced through investment recovery					
Green Purchasing					
The alcohol beverage manufacturer includes GSCM strategies in its strategic planning process					
The manufacturer assesses suppliers environmental management and activities					
The manufacturer considers the environmental impact of product at all stages of its life cycle.					
Eco-design					
The manufacturer provides design specifications to suppliers that includes environmental requirements when purchasing an item					
You have cooperation with suppliers for environmental objectives					

PART C: SUPPLY CHAIN PERFORMANCE

Please tick appropriately how you rate the operational performance of your supply chain in your firm with regards to the parameter listed.

5) Excellent 4) Very Good 3) Good 2) Poor 1) Very Poor

Parameters 5 4 3 2 1

Cost	5	4	3	2	1
Green purchasing reducing sources of wastes					
Saving energy					
Lower hazardous materials management and reporting					
Information sharing with environmental professionals reduces legal suits					
Customers are happy by existence of warrants					
Eco designed products reduces costs of sickness to customers					
Capturing materials and wastes reduces costs					
Scrap are sold to recyclers hence adds profits to the firm					
Reliability					
The manufacturer is flexible in ordering materials					
The manufacturer ensures timely delivery of materials					
Manufacturer ensures reliability in packaging					
The manufacturers' time for order process is short					
Flexibility					
The manufacturer has diversified in different products					
The manufacturer sources from different suppliers who best adhere to environmental considerations					
The manufacturer seeks advices from environmentalist on the product and processing methods					
The manufacturer offers different alternatives for the waste i.e. recycling or proper disposal					

Delivery					
Green purchase ensures evaluation of products during delivery					
Insurance of timeliness in delivery e.g. accelerate test process by NACADA,KEBS etc.					
The manufacturer has improved on visibility through verse logistics					
Timeliness in delivery enables manufacturer to reduce waste and expiry of products which leads to health and regulating issues					
Innovativeness					
The manufacturer use technology to ensure waste management and recovery					
The senior managers' support and rewards new ideas of green issues by mid-level managers					

**APPENDIX II: ALCOHOLIC BEVERAGE MANUFACTURERS REGISTERED
BY NACADA IN THE YEAR 2015**

1. Africa Spirits Limited
2. Crywan Enterprises T/A SAME Limited
3. Crystal World Agencies Limited
4. Jovin K. Limited
5. Julijo Investments
6. Lumat Company Limited
7. Lyniber Supplies Limited
8. Metro Distillers E.A. Limited
9. Moonwalk Investment Limited
10. Sherehe Industries Limited
11. Tana Investments Limited
12. Zheng Hong Kenya Limited
13. London Distillers (K) Ltd
14. Biscept Limited
15. Tihan Limited
16. Kenlab Supplies Limited
17. Kedsta Investments
18. Kenya Wine Agencies Ltd
19. Continental Beverages Ltd
20. Advance Limited
21. Fai Amarillo Limited
22. Telleny Beverages Limited
23. Cannate Breweries Limited

24. MDI Limited
25. Eagle Classic
26. Mashwa Breweries
27. Merchant Pinewood Limited
28. Roskin Agencies
29. Stesodor Company Limited
30. Grand Breweries Limited
31. Vinepack Limited
32. Kenya Breweries Limited
33. Lakers East Africa Limited
34. Tona Miller Limited
35. Marchi East Africa Limited
36. Crown Beverages Limited
37. Rift Valley Brewing Co.
38. Miti Brewers & Distillers Ltd
39. Grand Beverages Ltd
40. Tylex E.A. Brewers Ltd
41. Keroche breweries limited

Imported brands

Source (NACADA 2015)