AN EVALUATION OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES IN CEMENT INDUSTRY IN KENYA

(A CASE STUDY OF EAST AFRICAN PORTLAND CEMENT COMPANY LIMITED)

By

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DECLARATION

This research project is my original work and has not been submitted for a degree award in any other university. No part of this work should be reproduced without my consent or that of the University of Nairobi.

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Declaration by the Supervisor

This research project has been submitted for examination with my approval as University of Nairobi supervisor.

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DEDICATION

This project report is dedicated to my loving wife Mary to my son Kevin and daughters Kaitlyn & Abigail whose inspirations made me pursue this Master in Business Administration (MBA) course.

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ABSTRACT

The management concept of green supply chains was borne out of the necessity to conserve the environment on whose plane all the activities and processes of production and distribution of goods and services occur. Traditionally, Supply Chain Management (SCM) focused on the planning and integration of the network activities to procure raw materials, transform them into finished products and then distribute to end-user consumers. Greening the supply chains enables companies to efficiently use raw materials and conserve the environment by releasing biodegradable wastes. This research was carried out at EAPCC and endeavored to analyze the benefits of Green Supply Chain Management (GSCM) in the cement industry, establish GSCM strategies employed by EAPCC in leveraging its operational competitiveness and identify challenges faced by EAPCC in implementing GSCM practices.

The literature reviewed reveal that GSCM is practiced by companies both nationally and internationally with desired outcomes. Among the benefits cited by authors include cost reduction, reduction of waste, material substitution through environmental sourcing of raw materials, and waste minimization of hazardous materials. Descriptive research design was adopted to obtain primary data through an interview guide which was further analyzed using content analysis method. The study found out that companies adopt GSCM with challenges. The EAPCC has incorporated GSCM at the corporate level and even though challenges abound, the company is formulating measures to deal with these setbacks to optimize the benefits of GSCM. The study recommends that cement manufacturing companies in Kenya should formulate and implement GSCM strategy.

ABBREVIATIONS

ARM	Athi River Mining
EAPCC	East African Portland Cement Company
ESP	Electrostatic Precipitator
GDP	Gross Domestic Product
GSC	Green Supply Chains
GSCM	Green Supply Chain Management
ISO	International Organization for Standardization
JIT	Just In Time
NEMA	National Environment Management Authority
ROI	Return on Investment
SCM	Supply Chain Management

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The council of SCM professionals defines SCM as the process that encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Besides, and most importantly, it includes coordination and collaboration with channel partners such as suppliers, intermediaries, third party service providers and customers. In essence, SCM integrates supply and demand management within and across companies. Stevens (1989) summarized this definition, from the traditional standpoint, as the integration of business functions involving the flow of materials and information inbound to outbound ends of the business. However, it is important to note that environmental sustainability has become a critical issue to business practice in the 21st Century. Since the early 1990's, manufacturers have been faced with pressure to address environmental management in their supply chains (Wu & Dunn, 1995). Adding the 'green' concept to the 'supply chain' concept has brought a new paradigm where the supply chain must have a direct relation to the environment.

The GSCM is defined as the process of integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers and end-of-life management of the product after its useful life (Srivastava, 2007). This process develops outputs that can be reclaimed and re-used at the end of their life-cycle thus creating a sustainable supply chain. The whole idea of a sustainable supply chain is to reduce costs while conserving the environment. In recent times, the concept has been gaining significance among manufacturing companies due to the diminishing raw materials; deterioration of environment and increasing levels of pollution among other factors. GSC focuses on balancing marketing performance with environmental conservation. In countering the challenges of energy conservation and pollution abatement, companies have tried to green their supply chains through creation of networks of suppliers so as to purchase environmentally superior products and/or build common approaches to waste reduction and operational efficiencies (Srivastava, 2007).

Most companies, for example, have embarked on optimizing transportation operations and reducing their energy consumption. They are exploring ways to recycle and reduce packaging of their products. The expansion of green consciousness globally makes the business case for green a compelling one. Capturing the green advantage involves incorporating green strategies into planning, processes, products and promotions, reducing costs in some areas and improving materials and ingredients in others making sure customers understand the benefits of being green (Green Supply Chain Forum, 2008).

1.1.1 Green Supply Chain Management Practices

The GSCM is a distinct means for achieving the eco-management aims of a company and is also an innovation of SCM. Although GSCM is an extension of the existing SCM, it is also one aspect of eco-management that considers the environment from the macro point of view. A number of terms are used for GSCM, including environmental SCM and eco-supply chain management, depending on a researcher's point of view. Narasimhan & Carter (1998) defined GSCM as involving the purchase of methods that reduced the use of materials in addition to recycling and reuse. Godfrey (1998) defined GSCM as company practices that continuously monitor the environmental impact of a supply chain and improve its results. Further, Simpson & Power (2005) considered the closed form loop of environmental physical distribution activity, which involves reuse of materials and products, when defining the green procurement activity between a purchaser and a supplier from both the internal and external perspective of an organization.

Beamon (1999) emphasized the importance of cooperation with a company and defined GSCM as utilizing the supply chain between a central company and a cooperating company, to support the organization of eco management know-how in the central company and the development of clean manufacturing techniques. Such cooperation supports the strengthening of competitiveness based on environmental practices. The definition by Hervani (2005) is a concept that combines green procurement, environmental management of manufacturing materials, environmental circulation, marketing, and reverse logistics. Sarkis (2003) also defined GSCM as a combination of the activities of an environmental company and reverse logistics, and emphasized the latter's importance.

The financial gains of GSCM can be defined as cost reduction, enhanced market share, and an increase in profits. By promoting environment-friendly business activities, a company experiences gains not only on the cost side, such as reduction in energy consumption and waste, but also on the reputation side in that a possible environmental accident may be prevented. Hence, the economic and environmental gains bring about a synergistic effect.

1.1.2 Cement Industry in Kenya

Cement industry in Kenya is capital intensive and only a few cement companies use state of the art facilities in their manufacturing. The industry is also energy intensive and modern cement plants are highly automated. Cement firms operate in markets closely linked to the economic cycle with a back-forward linkage with many other sectors like energy and infrastructure. The industry plays a significant role in the climate change debate and energy accounts for up to 45 percent of cement production costs (Njeru, 2007).

The cement industry in Kenya has seen a steady growth due to the rapid growth of the Kenya's building and construction sector. Experts rate the average growth of the latter at 14.2 percent for the period 2006 – 2011 (Dyer & Blair, 2012). Whilst the industry is highly correlated to a country's economic performance, cement constructions have experienced superior growth in the country following the steady growth of Gross Domestic Product (GDP) since the formation of grand coalition government in early 2008. The key drivers of this growth include the rising demand for housing, the commercial construction boom sparked by increased foreign investment and extensive government and donor-funded spending on the country's infrastructure projects (Dyer & Blair, 2012).

Cement production increased at an average rate of 11.6 percent in the period 2006 to 2011 to 4.09 million metric tons in 2011 from 2.41 million metric tons in 2006 (Dyer & Blair, 2012). This rise in production was driven by new entrants and excessive capacity expansion by existing players in response to increasing competition. It should be noted that the industry also exports cement to markets in Uganda, South Sudan, Tanzania, the Democratic Republic of Congo and other East and Central African countries. For this reason, the production capacity of players in

the industry has been steadily increasing given that more often than not, demand surpasses supply of the commodity.

Currently, most of the major cement producers are operating at almost 90 percent capacity utilization rates ahead of capacity expansions planned over the next few years. With this degree of activities, the industry has had to contend with challenges such as climate protection, responsible use of fuels and raw materials, enhancing employee health and safety, reduction of carbon emissions, local imports and un-harmonized trade tariffs in the region. Other challenges include rising cost of inputs like energy, internal business processes like integration of sustainable development as a set of principles into management systems, relations with business partners and the society. These challenges therefore make the industry a good candidate for GSCM practices which will help to mitigate them and generate profits.

1.1.3 East Africa Portland Cement Company

In Kenya, cement history started in the early 1930's when in 1933, EAPCC began as a trading company importing cement mainly from England for early construction works in East Africa, and Blue Circle Industries of United Kingdom formed the company. The plant's initial production capacity was 60,000 metric tons of cement per year. But this has steadily increased over the years and currently production stand at 900,000 metric tons per year. The EAPCC targets a production of 1.3 million metric tons of cement per year as per the current strategic plan (EAPCC 2011-2016).

The EAPCC in its strategic vision aims to be the regional leader in the provision of cement, innovative cement products and solutions. This vision is reinforced by the mission statement of providing cement for infrastructural solutions to the satisfaction of all stakeholders. The company utilizes state of the art technology in its production operations and has fully automated all business processes to reduce paperwork. All these are geared towards enhancing the environment and creating collaborative relationships with environmental stakeholders and neighboring communities. The EAPCC has invested heavily to ensure that the environment is not affected by its operations. In all the plant unit operations, special attention is given in environmental protection by utilizing bag and electrostatic filters in capturing fugitive dust.

Other players who have joined the Kenyan market include Bamburi cement which was started in 1951 with its first plant located in Mombasa beginning production in 1954. Bamburi cement is the largest cement manufacturing company in the region and its Mombasa plant is the second largest cement plant in Sub-Saharan Africa. Athi River Mining (ARM) Cement Limited started as a mineral extraction and processing company in Mombasa Kenya. In 1997, it diversified its production and ventured into cement manufacturing. Other cement players that joined the market less than five years ago are Mombasa Cement, National Cement, Savannah Cement and most recently Cemtech Cement which is yet to commence operations in West Pokot County.

1.2 Problem Statement

The GSCM was borne out of the necessity to conserve the environment on whose plane all the activities and processes of production and distribution of goods and services occur. The SCM traditionally focused on the planning and integration of the network activities that procure raw materials, transform them into finished products, and then distribute to end-user consumers. This process was accompanied by seamless flow of information that ensured there is efficiency in the entire system. With time, companies realized that the raw materials were diminishing, energy was becoming more costly, and environmentalists were becoming critical on the activities of those companies that were deemed destructive to the environment and this put the reputations of these companies at stake. A case in point is the recent probe by National Environment Management Authority (NEMA) experts on dust emissions from ARM cement factory at Kilifi County. The initial tests on sample population from Mwandodo, Maereni and Bondora villages revealed that 80 percent of residents suffered from chronic lung disease called silicosis as a result of inhaling cement dust. Lastly but most importantly, governments established regulatory policies to safeguard the exploitation of the environment forcing companies to comply. Companies realized that to continue with their operations, they must make ‘green’ their supply chains, thus making GSCM the last option to embrace in order to remain relevant.

Globalization has therefore ensured that companies around the world become conscious of global warming as a direct consequence of their operational activities. Climate change is increasingly recognized as one of the most critical challenges ever to face humankind. It is a global problem

that requires a global response embracing the needs and interests of all countries. The United Nations Framework Convention on Climate Change, which came into effect in 1994 and its Kyoto Protocol that came into effect in 2005 – sharing the objective of the convention to stabilize atmospheric concentrations of greenhouse gases – enable such a global response to climate change (Kyoto Protocol Reference Manual, 2008). However, scholars and business practitioners differ whether or not GSCM is profitable. Quariguasi and his colleagues (2008) have argued that only a limited number of GSCM initiatives have proved to be profitable. Walley and Whitehead (1994) have also reiterated that significant improvement in the environmentally-friendly production is only possible with substantial investments that yields none or negative financial returns.

Andebe (2012) in her study to determine GSCM practices adopted by the textile industry in Kenya and the challenges faced on its implementation found out that the industry has adopted GSCM practices to a minimum extent. The study recommended all challenges to be dealt with first before successfully implementing GSCM practices. Mohamed (2011), in his study on GSCM performance in manufacturing firms in Mombasa, Kenya concluded that environmental challenges in Kenya are complex and the GSCM practices are yet to be adopted. Also, Omonge (2012) while seeking to determine effects of GSCM on operational competitiveness among Kenyan banks, found out that those different banks adopt different green supply chain practices depending on the activities that they are engaged in and also which green supply chain practice will yield better competitiveness to the bank.

According to Wisner (2011), there are two main types of business benefits derived from going green first, there are potential cost reductions where environmental change leads to increased resource efficiency, which in turn leads to improvements to business bottom line and the second relates to customer preferences and enhancing corporate reputation. (Mangan et al 2008) reiterated that effective management of resources and suppliers can reduce production costs, promote recycling and reuse of raw materials. In fact, they argued that this also reduces the production of hazardous substances thereby preventing organizations from being fined as a result of violating environmental regulations (Mangan et al., 2008). Cuthbertson (2010) added that, the

relevant operational costs are reduced whilst the efficiency of using resources is improved as a result of applying GSCM practices.

Given the imperative adaptability of GSCM by companies and the global concern to go green in their operations, this research has identified the scantiness of studies done on GSCM practices in cement industry in Kenya. Furthermore, given that no such study has been carried out at EAPCC, this study therefore aims to analyze benefits of GSCM in the cement industry, establish GSCM strategies employed by EAPCC in leveraging its operational competitiveness and identify challenges faced while implementing such strategies.

1.3 Research Objectives

The general objective of this study was to evaluate GSCM practices in cement industry in Kenya. The study was guided by the following specific objectives:

(i) Analyze the benefits of GSCM practices in cement industry in Kenya.

(ii) Establish GSCM strategies used by EAPCC in leveraging its operational competitiveness.

(iii) Identify challenges faced by EAPCC in implementing GSCM.

1.4 Value of the Study

The findings of this study will benefit companies that have not yet embraced the practice of GSCM. Since the study also intends to look at the different GSCM strategies, companies will find the study helpful when choosing which strategies to adopt and expect positive outcome.

The cement industry in Kenya will benefit from this study given that it outlines the areas that make GSCM practices a viable option especially with respect to energy conservation, environmental conservation and compliance with government regulations issued by agencies such as NEMA. This also includes companies abandoning operation practices that escalate global warming. The study is expected to be useful to academicians and researchers who may intend to inquire more knowledge on GSCM practices. It is expected to be an interesting piece of literature for readers who would want to get informed on the concept of GSCM. Furthermore, it will benefit a great deal communities living around the cement firms and will equip them with knowledge on cement related illnesses and how to overcome them.

1.5 Overview of the Research

Chapter one provides a background to this study. It depicts how the cement industry has steadily grown in Kenya since early 1930s. It also contains the research problem, research objectives and significance of the study. Chapter two is a review of relevant literature around the subject of GSCM, its benefits and challenges of implementation. The chapter will dwell mainly on GSCM strategies and how the cement industry can benefit out of it. Chapter three presents the research methodology and outlines how the research will be conducted and the strategies to be used for sampling, data collection and analysis. These strategies will be guided by the objectives of the study. Chapter four shows how the data was analyzed presented and interpreted while chapter five gives a summary of research findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter contains a review of literature on the benefits and strategies of GSCM practices. The chapter looks at the literature on the benefits of GSCM and brings out how firms can benefit as a result of adopting the concept. The chapter further reviews the literature on the challenges of implementing GSCM. Empirical and theoretical studies on the strategies of GSCM are reviewed in the chapter. Lastly, the summary of research gaps is contained at the end of the review of relevant literature.

2.2 Review of Relevant Studies

According to Srivastava (2007), GSCM is gaining increasing interest among researchers and practitioners of operations and SCM. The growing importance of GSCM is driven mainly by the increasing deterioration of the environment; that is, diminishing raw material resources, overflowing waste sites and increasing levels of pollution. Nevertheless, it is not just about being environment friendly, but rather about good business sense and higher profits. In fact, it is a business value driver and not a cost centre (Wilkerson 2005). In addition, the regulatory requirements and consumer pressures are driving GSCM practices. Hence, the scope of GSCM ranges from reactive monitoring of the general environment management programs to more proactive practices implemented through various R's such as reduce, re-use, rework, refurbish, reclaim, recycle, remanufacture, reverse logistics, among others (Srivastava, 2007).

The GSCM focuses on both environmental management and SCM. Introducing the 'green' component to SCM involves addressing the influence and relationships between supply chain management and the natural environment. The definition and scope of GSCM in the literature has ranged from green purchasing to integrated green supply chains flowing from supplier to manufacturer to customer, and even reverse logistics (Zhu & Sarkis 2004). Srivastava (2007) defined GSCM as the process of integrating environmental thinking into SCM, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life.

Mohamed (2011) argues that in order for economies to embrace new environmentally responsible values, beliefs and behaviors, there is a strong need to green the entire supply chain. The objective of his study was to identify GSCM practices and the challenges faced by manufacturing firms. The results obtained indicated that GSCM had positive impact on manufacturing firms in Mombasa. The relevance of GSCM in overcoming environmental challenges was highly appreciated. Factors acting as barriers to adoption were exemplified. The conclusions and directions for further research point to the fact that environmental challenges in Kenya are complex and GSCM practice is yet to be adopted. The government has been viewed as the one responsible for the slow pace towards implementation of GSCM. This creates the quest for further research in the same area including the service sector.

Omonge (2012) in his study found out that different banks adopt different green supply chain practices depending on the activities that they are engaged in and also which green supply chain practice will yield better competitiveness to the bank. He also established that most of the banks' green supply chain practices involved environmental collaboration, monitoring, purchasing and the greening of the production phase. Further, the competitiveness among the banks resulted from the green supply chain practices which include improved operational efficiency, increased customer base, offering superior services and reduction in waste level. All these lead to improved financial performance. The study concluded that incorporation of green practices in the operations of organizations should form part of long term strategy of the organizations to gain competitive advantage over its competitors. It has, therefore been recommended that organizations should consider adopting green supply chain fully as the potential benefits to be realized are enormous compared to the initial and operation cost of implementing the practice. Andebe (2012) in her study to determine GSCM practices adopted by the textile industry in Kenya and the challenges faced on its implementation found out that the industry has adopted GSCM practices to a minimum level. The study recommended all challenges to be dealt with first before successfully implementing GSCM practices.

Dheeraj and Vishal (2012) in their study on GSCM application in India discovered that globalization has increased the opportunities for buyers to focus on environmental improvement, which increases the supplier environmental performance. They envisaged that this is true for

organizations that regard environmental improvement as a social goal and not just a cost issue, risk or public image. Accordingly, manufacturers need to work with their suppliers of raw material and components in order to produce environmentally friendly products (Dheeraj & Vishal, 2012). They concluded that by using their purchasing power, the industries can set up environment criteria for their suppliers upstream in the supply chain.

A study conducted by Zhu and Sarkis (2004) on the relationship between pressure practice on performance vis-à-vis GSCM practices on the Chinese automobile industry, revealed that on increasing pressure on performance from a variety of directions, have caused the Chinese automobile industry's supply chain managers to initiate carrying out GSCM practices to improve both their economic and environment performance. This research contextualizes the findings of that study in Kenya and feels that when applied on the cement industry to be environmentally friendly, then GSCM practices will be indispensible.

Many authors are exploring environmental initiatives within each of the major phases of the supply chain. However, much of this research, as observed by Sarkis (1999), is focused mostly on only one functional area. Handfield and Nichols (1999) define SCM as all the activities associated with the flow and transformation of materials from raw extraction phase through to the consumption of goods and services by an end user, along with associated information flow, both up and down the supply chain. Consequently, there is a need to focus GSCM on the totality of the supply chain in both an upstream and downstream direction (Handfield & Nichols, 1999).

The research done by Rao and Holt (2005) on whether or not GSCM practices lead to competitiveness and economic performance in South East Asian companies revealed that GSCM promotes efficiency and synergy among business partners and their lead corporations and helps to enhance environmental performance, minimize waste and achieve cost savings. This synergy is expected to enhance the corporate image, competitive advantage and marketing exposure (Rao & Holt, 2005). However, if GSCM practices are to be fully adopted by all organizations in South East Asia, they argued, a comprehensible link between such measures and improving economic performance and competitiveness is necessary. In fact, Bowen and others (2001) concurred that

organizations will adopt GSCM practices if they identify that this would result in specific financial and operational benefits.

Researchers have argued that greening the supply chain has numerous benefits to an organization, which range from cost reduction, to integrating suppliers in a participative decision-making process that promotes environmental innovation (Bowen et al., 2001; Hall, 2003; Rao, 2002). As a matter of fact, a sizeable part of the inbound function essentially comprises of green purchasing strategies adopted by organizations in response to the increasing global concerns of environmental sustainability. Rao and Holt (2005) posited that green purchasing can address issues such as reduction of waste produced, material substitution through environmental sourcing of raw materials and waste minimization of hazardous materials. Given that the involvement and support of suppliers' is crucial to achieving the mentioned goals, organizations are increasingly managing their suppliers' environmental performance to ensure that the materials and equipments supplied by them are environmentally-friendly in nature and are produced using environmentally-friendly processes (Rao & Holt, 2005).

Min and Galle (1997) in their research, explored greening the purchasing in order to determine the key factors affecting a buying organization's choice of suppliers, the key barriers and the obstacles to green purchasing initiatives. Sroufe (2003) presented a framework that involved performance indicators and supplier assessment metrics that argued that environmental initiatives such as strategic environmental sourcing improve an organization's competitive position and reduce risks. While exploring green purchasing strategies as a component of greening the inbound function of supply chain, Min and Galle (1997) considered selected industry groups, namely heavy producers of scrap and waste materials and identified that green purchasing make a significant contribution towards source reduction of pollution in terms of recycling, re-use and low-density packaging and towards waste elimination in terms of scrapping or dumping, recycling and sorting for non-toxic incineration and bio-degradable packaging.

2.3 Benefits of Green Supply Chain Management Practices

Environmental responsibility has shifted from a trend to a business imperative thus helping companies to achieve their business goals. Over the last few years, sustainability has been

steadily moving from the periphery to the heart of business. Companies are adopting sustainable practices for a host of reasons depending on the industries and geographies in which they operate in. One such reason is to reinforce their environmental protection policy which in turn can earn them extremely marketable environment friendly image leading to higher sales and profitability (Fortes, 2009). The reason being GSCM involves “greening” the design of a product or service that encourages environmental awareness thus leading to eco-friendly green operations, reverse logistics, waste management and green manufacturing. In greening the supply chain therefore, there are three business drivers for profitability. The first driver to promote greening is response to rising raw material cost. The second is the result of the availability of substitutes for the suppliers' product/ material. The third business driver for this greening strategy is changes in how suppliers contribute to the quality or service of the industry products (Fortes, 2009).

Developing synergies between operational performance and environmental excellence may lead to a more globalised level of customer satisfaction; one that includes both cost competitiveness and environmentally sound products and processes at the same time overcoming the traditional economic assumption that being environmentally sound reduces productivity (Van den Broek, 2010). Van den Broek added that potential benefits of GSCM relate to cost avoidance and risk reduction. This includes cost avoidance of purchasing hazardous materials as inputs, which reflect the internalized cost associated with environmental harm, cost avoidance of storing, managing and disposing process waste, cost avoidance of stigmatization or market resistance to environmentally harmful products and cost avoidance of public and regulatory hostility towards environmentally harmful organizations, reduced environmental and health risks, liability risk and safer cleaner factories (Van den Broek, 2010).

It must be noted that there is no easy way to quantify the cost of going green. According to a paper written by the Rotterdam School of Management, for example, only a limited number of initiatives for environmentally-friendly production have proved to be profitable (Quariguasi et al., 2008). Moreover, literature and practice suggests that substantial improvement in the environment is only possible with substantial investments that bring none or negative financial returns (Walley & Whitehead, 1994). The adoption of cleaner solutions is generally bounded by an increase in costs. Companies should look at the cost of sustainability initiatives as an

investment and should look for good trade-offs between environmental impacts and costs. In their recent survey, Deloitte (2008) identified cost savings and competitive advantage as the top two business drivers for GSCM, reinforcing the view that supply chain efficiency and innovation, consistent with sustainability goals, should be the primary aims of green supply chain initiatives. Yet a surprisingly high number of participants acknowledged that GSCM measures to date are not expected to generate positive return on investment for at least three years.

The business benefits of environmental improvement are getting progressively clearer as a result of GSCM practices. The more businesses and consumers take environmental issues seriously, the greater the gains to be made. There are two main types of business benefits; first, there are potential cost reductions. Environmental change often boils down to increased resource efficiency, which in turn leads to improvements to the business bottom line. Secondly, benefit relates to customer preferences and enhancing corporate reputation. More and more businesses and consumers are using environmental issues as a criterion in their purchasing decisions, so progress in this area can lead to increased sales and marketing activities (Wisner, 2011).

The GSCM practices ensure that there is effective utilization of all available productive resources of the organizations. Therefore, by incorporating this concept in the business decision making process, organizations may begin to purchase green input resources that will flow through environmental friendly production process to produce the desired green outputs. At the core of this concept, there is the principle of reducing waste by increasing efficiencies. Effective management of resources and supplies can reduce production costs, promote recycling and reuse of raw materials (Mangan et al., 2008). This also reduces the production of hazardous substances thereby preventing organizations from being fined as a result of violating environmental regulations. By the same token, the relevant operational costs are reduced whilst; the efficiency of using resources is improved (Cuthbertson, 2010).

2.4 Challenges of Implementing Green Supply Chain Management Practices

Researchers have identified some of the obstacles that organizations face while in the process of implementing GSCM. Like any other concept of business, there is likelihood that companies will

face challenges when trying to adopt this business concept. The Ryder Center for Supply Chain Management (2008) has come up with three challenges that organizations grapple with while trying to green their supply chains. These include lack of appropriate technology to support the effort of going green, the need of business processes to capture the appropriate data in supply chain to make use of the available technology and the trade-off between green requirements and lean processes.

It has been argued that technology provides energy-efficient solutions with a lot more favorable impact on the environment. Therefore, information technology can aid in greening supply chain by optimizing the resources needed to support the business (Muchiri, 2011). The researchers warned that green supply chain technologies can hardly work independent of the business processes in the supply chain system. Thus, both the green supply chain and the supply chain are complementary. Mollenkopf and others (2010) have argued that lean and green strategies are often seen as compatible given their shared focus on waste reduction. Leanness focuses on reduced amount of inventory to go through the supply chain which minimizes the negative environmental impact of the supply chain. However, lean strategies that employ Just-In-Time (JIT) delivery of small batch sizes which improves sufficiency can require increased transportation, packaging and handling which increase emissions contradicting the green approach.

Most organizations that implement green supply chain practices rarely integrate environmental factors into their SCM systems (Cash & Wilkerson, 2003). They argued that their approach is often driven by a need to green an existing process or a piece of the chain. Even though this could have a positive impact on the environment, the environmental aspects are frequently not considered when those responsible for reviewing a business' overall supply chain performance make changes in the supply chain. They further argued that it is only after the changes in the supply chain have been implemented and their effects on the environment revealed that the idea of greening the supply chain has the opportunity to emerge (Cash & Wilkerson, 2003). A research on the barriers of GSCM implementation in Indian automobile industry revealed that high cost is a big pressure in GSCM compared to the traditional SCM. The initial investment required by green methodologies such as green design, green manufacturing, green labeling of

packaging, among others, are too high. The researchers concurred that there are two types of costs associated with environmental engagement direct cost and transaction cost. Both of these costs according to AlKhidir and Zailani (2009) are likely to constitute significant challenges to implementation of GSCM.

Top management support and commitment is necessary for any strategic program success (Hamel & Prahalad, 1989; Zhu & Sarkis, 2007). In fact, top management support is especially useful for environmental practices such as GSCM. It has significant ability to influence, support actual formation and implementation of green initiatives across the organization (Zhu & Sarkis, 2007). Top management usually provides continuous support for GSCM in the strategic plans and actions plans for successful implementations. It therefore, means that without the support of the top management, implementation of GSCM initiatives will not pick up.

2.5 Green Supply Chain Management Strategies

Researchers and professionals of GSCM have identified various strategies that if well applied can lead to the realization of the benefits of GSCM. According to Simpson and Simpson (2008), one such strategy is risk-based strategies which focus on risk minimization. Organizations apply this strategy in response to shareholders requirements and it is ideal for an organization that retains minimal internal environmental management resources. Since the strategy is based on minimal inter-organizational engagement, it might involve the inclusion of basic clauses in purchasing contracts for suppliers to meet all pertinent regulatory requirements (Simpson & Simpson, 2008). King et al (2005) remarked that this strategy cascades the established International Organization for Standardization (ISO) 14001. They further noted that most organizations, including Ford Motor Company, use the strategy with their suppliers through to their supply chains (King et al., 2005) to offer established environmental performance benefits (Melnyk, 2003), third-party management performance and a system globally accepted by organizations.

The eco-efficiency strategy or lean-and-green approach to GSCM has developed as one of the complex strategies that organizations adopt to address the impact of their activities to the environment (Simpson & Simpson, 2008). This strategy draws environmental performance

benefits for the supply chain beyond mere regulatory compliance through the requirement for suppliers to meet operations-based efficiency objectives. A lot of environmental performance comes from specific manufacturing practices that have been found to provide secondary environmental performance benefits (Melnyk, 2003). The efficiency-based has both economic and environmental performance benefits to the supply chain and the requirement for the higher level of engagement between customers and suppliers (Simpson & Simpson, 2008). This strategy ties environmental performance to operational processes in the supply chain and allows the extension of performance requirements into the supply chain that maximize economic performance and provide secondary environmental performance benefits through waste and resource use reductions. The strategy requires a higher level of involvement between supply chain partners arising from the use of more complex inter-firm performance requirements. However, using this strategy to facilitate greater efficiency in the supply chain does not require the development of co-specialized resources specific to environmental performance (Simpson & Simpson, 2008).

Innovative-based GSCM strategies have been identified to expedite the implementation of greening the supply chain in most organizations (Simpson & Simpson, 2008). This strategy is different from the efficiency-based strategy because of its use of a supply chain environmental performance strategy that is more specifically environmental. Bowen and others (2001) observed that organizations are increasingly aware of the potential for narrow purchasing policies to in-source components or services from suppliers that may be legally non-compliant with environmental regulations or who themselves procure goods in an environmentally irresponsible way. Once a supply chain begins to consider specialized processes, technologies, or complex performance standards for suppliers such as chemical avoidance, the level of knowledge exchange and relational investment begins to change. Moving from an efficiency-based GSCM strategy to a greater level of innovation or integration of environmental performance in supply chain and product design requires specialized environmental resources (Lenox & King, 2004).

According to Simpson and Simpson (2008), closed-loop strategies are a recent type of GSCM strategy and represent the complex and collaborative form of GSCM. In its basic form, closed-loop strategy is often referred to as ‘reverse logistics’, it involves the capture and recovery of

materials for either re-manufacture (high-value) or recycling (low value) (Kocabasoglou et al, 2007). These materials can arise during production, as returned goods, post-use and at end-of life. The strategy integrates environmental performance to the whole supply chain. Prominent examples of companies that have used closed-loop strategy include Kodak's return and re-manufacture of its disposable cameras, Hewlett Packard's retrieval of used printer cartridges and BMW's end-of-life vehicle requirements for suppliers (Guide et al, 2002).

The motivation for a closed-loop strategy, however remains low for basic reasons of poor and distributed control over the reverse supply chain, lack of available infrastructure and the inability of supply chains to believe that such activity is economically viable (Simpson & Simpson, 2008). Richey and colleagues (2005) observed that designing and successfully using a closed-loop strategy presents one of the most complex endeavors for a single organization to do within its supply chain. In its basic form, 'closed-loop' may involve product take-back and reverse logistics implemented only in the retail portion of the supply chain. In more complex 'closed-loop' systems, used or obsolete products and waste are taken back by the producer and remanufactured or recycled (Richey et al., 2005).

2.6 Summary

There are a few research gaps that the researcher identified from the reviewed literature. It emerged from the literature that most scholars talked so much on the general benefits of the concept of GSCM both to the organization and the environment. The most mentioned variables included reputation of the organization, compliance with the environmental legislations, environmental sustainability and customers' satisfaction with green initiatives, among others. However, there were very few researches that talked about the profitability that an organization gets by specifically implementing GSCM strategies. Moreover, such research may also consider the operational competitiveness that an organization may have as a result of using GSCM practices ahead of its competitors. Finally, from the reviewed literature, no single study looked at benefits of GSCM practices and challenges of the same in Kenya's cement industry. Given the lack of literature on this industry, this research sets out to provide the same, specifically for this industry, by the findings of this study.

The reviewed literature has showed benefits that organizations derive as a result of adopting GSCM practices. Some of the mentioned benefits include good reputation that comes as a result of satisfied customers who are conscious of environmental preservation. Similarly, organizations that practice GSCM get little environmental-related litigation if any and therefore, they can focus on their core business activities. Additionally, GSCM practices help organizations to efficiently use the natural resources such as raw materials without wastage. They can also improve on the efficiency of their supply chain activities and further reduce waste through reverse logistics. Eventually, scholars consider these practices as increasing the performance of an organization and with it may come profitability and competitive advantage.

The literature identified some of the challenges that most organizations face in the process of implementing GSCM practices. These include lack of appropriate technology to support the effort of going green, the need of business processes to capture the appropriate data in supply chain to make great use of the available technology, and the trade-off between green requirements and lean processes. Finally, the literature reviewed has given certain GSCM strategies that organizations can adopt to achieve the objectives of the concept. They include innovation-based strategies, risk-based strategies, efficiency-based strategies and closed loop strategies.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology which was used to achieve the objectives of the study outlined in Chapter One. Further, the chapter discusses the following aspects of research that the study utilized research design, target population, sampling design, research instruments, data collection and procedure and data analysis.

3.2 Research Design

The study utilized a descriptive design that is appropriate to researches seeking to describe the characteristics of certain groups, estimate the proportion of people with distinct characteristics, and make predictions. The purpose of a descriptive study is normally to gather information about the present existing conditions without making amends to the actual observation (Creswell, 1994). Therefore, this study aimed at gathering information from EAPCC. Descriptive survey, according to Best and Kahn (1998) has the ability to produce statistical information about aspects of education that interest policy-makers and researchers.

According to Orodho (2003), descriptive research designs are used in preliminary and exploratory studies to enable researchers gather information, summarize and interpret the data. The purpose of descriptive research according to Mugenda (2003) is to determine and report phenomena and help in establishing the current population under the study. The research anticipated the chosen design will adequately address the research questions and hence meet the objectives of the proposed study.

3.3 Target Population

This study aimed at interviewing executive managers, senior managers and supervisors at EAPCC whose total population was 263 and whose information would enable achieve the objectives of the study. Mugenda (2003) reiterates that the target population should have some observable traits to which the research aims at when generalizing the result of the study. Profiling had been done since the nature of the information required could have only be obtained from the target population and not anyone else.

3.4 Sampling Design

The research used stratified random sampling method to narrow down on the target population. According to Wysocki (2007), when sub-populations are varied, it is important to sample each sub-population (stratum) independently. This helps in grouping members of the population into relatively homogeneous sub-groups before sampling (Wysocki, 2007).

The interviewees in this study included executive managers, senior managers and supervisors. Executives were expected to give information on the corporate strategy of the company regarding green supply chain management. Senior managers were expected to highlight on the GSCM strategy formulation, benefits and challenges that the company faces as a result of adopting the same. Finally, the supervisors were expected to highlight on operationalization of the green supply chain practices within the company. The information by the latter will be helpful in explaining the challenges and benefits of the concept.

A sample size of 30 percent was subjected to each stratum giving a summation of 79 prospective respondents. The rationale was to follow the rule that each stratum should be mutually exclusive, that is, every element in the population must be assigned to only one stratum as shown in Table 1 below.

Table 1: Sample Size

Population Category	Frequency	Sample Size	Percent
Executives	13	4	5
Senior managers	131	39	49
Supervisors	119	36	46
Total	263	79	100

3.5 Data Collection

This research used both primary and secondary data. Interview guides were used to facilitate the collection of data from the respondents. Primary data was collected by way of personal interview with an interview guide that consisted of open ended questions. The research questions of this study could best be answered using personal interviews where the researcher interacted with respondents asking them exactly how GSCM practices are formulated and implemented,

strategies used, benefits that accrue and the challenges that the organization faces with respect to implementing GSCM practices.

Secondary data was beneficial to the study because the researcher referred to it to expound on concepts that would emerge from data collection. Of particular importance was NEMA's environmental guideline for prevention and control of fugitive emissions from cement plants, which requires the industry to prevent fugitive emission from all active operations and storage piles such that the emissions are not visible in the atmosphere beyond the boundary line of the emission source. Among these guidelines include using dust suppression system in limestone and coal processing and using bag filters instead electrostatic precipitators (ESP) to filter air going to the atmosphere.

3.6 Data Analysis

Considering the qualitative nature of the study and the envisaged response as per the interview guide, the data was analyzed using qualitative content analysis. Content analysis is a method of summarizing any form of content by counting its various aspects, thus enabling a more objective evaluation. The content analysis was carried out to identify key themes as expected through the choice of words by the respondents. Analysis of data collected was compared with theoretical approach and themes in literature review. The analyzed data was thereafter interpreted with respect to research questions.

3.7 Data Reliability and Validity

The research sought authority from the managing director of EAPCC in order to administer the interviews. To ensure reliability and validity, the researcher pre-tested the interview guide on five respondents whose inputs did not form part of the final study. This enabled the researcher fine tune the interview questions before final administration.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents data that emanated from the findings of the research. The content was analyzed according to the responses provided by the respondents during the interview with the researcher. The analysis and interpretation was done with the aid of secondary data in order to authenticate the results found. The research largely used qualitative analysis and part of the analysis of bio profile in tabular format associated with quantitative analysis was used.

4.2 Response Rate

The researcher managed to interview 50 respondents out of the 79 who had initially been sampled. This was 63 percent of the sampled population which was considered a good percentage. Out of the 50 interviewees, there were two executive managers, 15 senior managers and 33 supervisors. The low response from executive managers was due to their tight and busy schedules hence getting the targeted number was a challenge. However, the researcher managed to obtain all the information deemed necessary for the study. The reduction on the number of interviewed senior managers and supervisors was also attributed to the busy schedules brought about by increased operations that the company experienced during the period of information gathering.

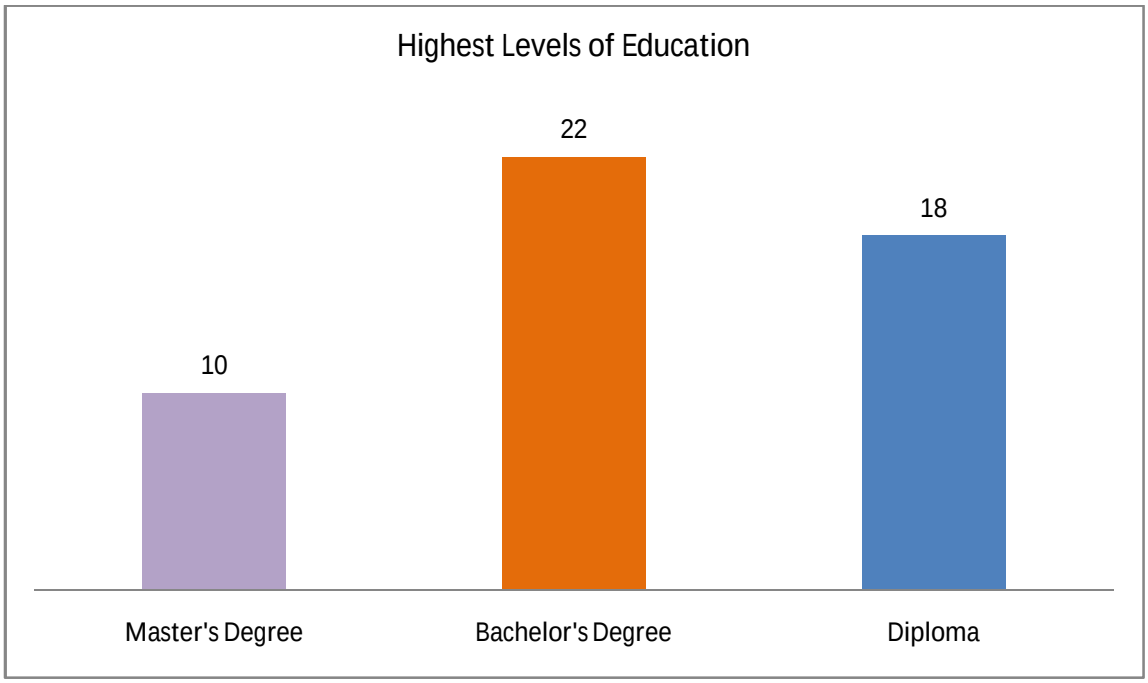
Table 2: Response Rate

Response Rate	Frequency	Percent
Response	50	63
Non Response	29	37
Total	79	100

4.3 Background of the Respondents

The statistics on the respondents' highest levels of education reveal that all executive managers interviewed and eight senior managers had master's degrees, seven senior managers and 15 supervisors had bachelor's degrees and 18 supervisors had diplomas. Figure 1 below shows the distribution of the highest levels of education attained by the respondents.

Figure 1: Highest Levels of Education



The levels of education are indicative of the knowledge that the respondents have acquired as well as their expertise. The levels further allude to the professionalism of the respondents and the ability to understand the requirements of the interview. The researcher was therefore confident that whatever response was obtained originated from informed sources and was not likely to give a biased or untrue data.

The period of work experience of those interviewed ranged between three years to 28 years. Senior managers emerged as the most experienced owing to the average period of 15 years. This was followed by executive managers at 10 years of experience and lastly, supervisors at four years of experience. The significance of this period is the ability of one to have the knowledge of company operations and how to transmit the same should there be need. The researcher did find these periods long enough to credit the information obtained from the respondents. Having worked in the company that long, respondents interviewed were able to give a proper account of the progress of the implementation of GSCM practices and its impact on performance.

4.4 Green Supply Chain Strategy Formulation and Implementation

From the responses obtained after the interview, it emerged that all executive managers agreed that EAPCC had a corporate strategy. They were unanimous that the company cannot manage its

green supply chains without a corporate strategy to guide it. It was revealed that the company introduced the concept of GSCM in the year 2010 with the primary aim of enabling it to focus more on reduction of fugitive dust, operational cost reduction and the avoidance of conflict with legislative bodies, especially NEMA. One respondent singled out the objective of energy conservation as a way of reducing production cost, facilitated the process of formulating GSCM strategy at corporate level.

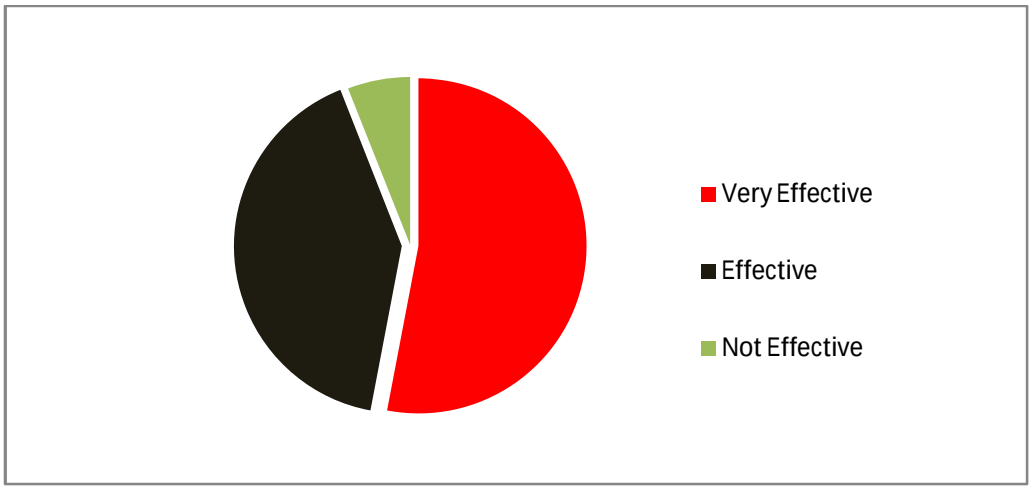
Since the year 2010, EAPCC has been keen on its supply chain system. Executive managers have been in the forefront to ensure that the supply chain is greened given that this is the only way through which the company will be at peace with the environment and cognizant of its spending on production. Apart from complying with environmental regulations and production cost reduction, the executive managers interviewed cited forging a long-term relationship with their clients/customers as another driver of formulating GSCM strategy. This, they said, is important because green supply chain enables the company to keep the environment clean for use by the society from which its customers emerge. Moreover, they said, most of their customers are aware of the dangers of environmental pollution and will be keen to buy products from a company that is seen as doing something to eliminate pollution to the environment. In so doing, they contended, the company will have a sustainable relationship with its customers and suppliers leading to greater revenues in the long run. Another reason that was given for formulating GSCM strategy was competition in the market and the need to make supply chains lean. Some respondents noted that it is imperative to have a lean SCM in order to be effective. Lean SCM minimizes wastage of resources and is effective. The company could therefore adopt GSCM being an aspect of lean SCM, as a competitive tool to gain greater market share.

Some of the executive managers elaborated the rationale of this competitive nature of their adopted GSCM strategy. They said that through greening the operations, there would be reduction in wastes as well as pollution and this will further help the company to avoid legislative penalties. In turn, the company will be profitable having successfully put measures in place to seal all the loopholes where it loses resources. Senior managers who participated in the interview emphasized that it was them who formulate GSCM strategy before proposing them to the executive managers to be discussed at the corporate level. They were unanimous that the

formulation of GSCM originates from the need to reduce waste and pollution to the environment. Some senior managers, however, cited the need to reduce operational cost as well as the need to compete favorably in the market with companies that have adopted the practice. Some of the GSCM strategies that have been formulated at this stage were quality controls, control of fugitive dusts, avoiding double handling and waste reduction. These areas are very much affected in the supply chain and therefore it is important to green them so as to optimize the system and yield desirable outcome.

The research intended to find out how effective these strategies have been in the realization of GSCM at EAPCC. The responses received were varied ranging from very effective, effective to not very effective. Among those interviewed, 53 percent agreed that the strategies are very effective, 41 percent said that the strategies are effective while 6 percent thought that the strategies are not very effective in achieving the benefits of GSCM. The respondents who argued that the strategies are not effective were of the opinion that the company is still battling with containing fugitive dust from Electrostatic Precipitators (ESP) which ends up in the atmosphere. They further reasoned that NEMA has already compelled the company to change from ESP to bag-house system which is more effective in filtering dust. These issues, according to them, do not make the strategies very effective.

Figure 2: East African Portland Cement Company Strategy Effectiveness



Respondents who were positive that the strategies formulated help in the achievement of GSCM benefits argued that the company has done well in quality controls and other areas such as reduction of production cost and good corporate image. They said that the company was

acquiring new market shares because of good corporate image which was attributed to the effort they have made towards minimizing the emission of fugitive dusts to the atmosphere. Moreover, these respondents cited how significant the company had reduced cases of double handling which were unnecessary costs to the company in the long run. However, they acknowledged that the company still has to do more on its green supply chain system so that it completely stops emitting fugitive dusts in the atmosphere.

4.5 Benefits of Green Supply Chain Management to East African Portland Cement Company

There are many benefits that an organization can achieve as a result of adopting green GSCM practices. As mentioned earlier, the main motivating factor to adopt GSCM practices, according to the respondents, was to enhance the company's reputation and improve market image. Some respondents added that becoming a market-leader through innovation was also a motivation for taking up GSCM, besides the pressure to follow others who are either partners or competitors.

Respondents cited significant reduction of environmental litigations and compliance with environmental regulations as one of the benefits that accrue as a result of adopting GSCM practices in a company. Since the company adopted green supply chain practices, NEMA has seldom confronted it on complaints of environmental pollution. For this reason, the strategy had worked quite well in helping the company avoid court cases and punitive measures imposed by NEMA as a result of environmental pollution. Other respondents, nevertheless, argued that the sheer number of regulations, influences such as changing customer needs and the complexity of the global marketplace, make it difficult for companies to use GSCM practices only. It is important to note that the environment and safety are not merely social or political issues; they are vital ingredients that contribute to the performance of a company. These rising environmental pressures and social expectations can be turned to commercial advantage if a strategic approach is taken to develop a "green" supply chain.

Majority of the interviewed senior managers agreed that green supply chains enables optimum utilization of all available productive resources of organizations. By incorporating GSCM strategic thinking through its entire business decision-making process, EAPCC purchased green

input resources that flow through environmental friendly production process to produce the desired green outputs. This is very important because it ensures that all the machineries and the expertise of the staff are used to bring desirable change to an organization.

According to a number of respondents, especially the supervisors, at the core of GSCM are the principle of reducing waste by increasing efficiencies. Senior managers noted that effective management of resources and supplies can reduce production costs, promote recycling and also reuse of raw materials. Moreover, the production of hazardous substances can be reduced, thereby preventing organizations from being fined as a result of violating environmental regulations. Consequently, the relevant operational costs are reduced whilst the efficiency of using resources is improved.

Respondents observed that, generally companies that produce products which are technologically advanced and environment friendly will find that this will enhance the brand image and brand reputation in customers' mind. The EAPCC has had an excellent corporate image as a result of adopting GSCM practices. The feedback obtained from various stakeholders is indicative of this improving company's image. Such feedback is attributable to the application of GSCM practices which has ensured that the environment around it is free from hazardous substances.

4.6 Challenges of Implementing Green Supply Chain Management Strategy at East African Portland Cement Company

From the responses given, it emerged that the company faces problem of lack of appropriate technology and business processes needed to implement GSCM strategies. Usually, technology provides energy efficient solutions that have a more favorable impact on the environment. The company, for instance still uses ESP technology to reduce emission of fugitive dust in the atmosphere instead of bag-house system which NEMA has proposed to the company. Actually, according to senior managers interviewed, this new technology will be rolled out in March 2014.

Some respondents intimated that information technology, which is not well established at EAPCC, has the capacity to make the supply chain greener by optimizing the resources required to support the business and also enable more effective supply chain planning, execution and

collaboration thereby reducing resource requirements. Furthermore, it was noted that green supply chain technologies can hardly work independent of the business processes in the supply chain. Both the green supply chain and the supply chain are a complement of one another. A supply chain technology cannot work without the business process. The EAPCC has no proper business processes that can spur the speedy use of green supply chains. Therefore, there is need to have a process that captures such data and make GSCM efficient and effective.

Another challenge that was cited widely is the trade-off between green requirements and lean practices. Scholars and practitioners of SCM have observed that lean and green strategies are often seen as compatible because of their shared focus on waste reduction (Muchiri, 2011). Leanness stresses on reduced amount of inventory to go through the supply chain which minimizes the negative environmental impact of the supply chain. The EAPCC has been faced with this challenge of trade-offs to make its green supply chain effective. For example, lean strategies that employ JIT delivery of small batch sizes tend to improve sufficiency and can require increased transportation, packaging and handling which increase emissions contradicting the green approach. Another area cited by respondents was outsourcing which may involve parts of the production process being transferred to plants on the other side of the country, only for the products to be transported back for the next part of the supply chain process which requires additional transportation and thus increasing emissions.

Failure to integrate supply chain optimization efforts with green supply chain efforts was also cited as one setback to greening the supply chain at EAPCC. This observation was in agreement with Wilkerson (2003) who had argued that most firms implementing green supply chain practices do not actually integrated environmental considerations into their SCM processes. The duo had explained that the approach is usually driven by a need to green an existing process or a piece of the chain. This is what EAPCC did with its ESP that has not been effective in reducing the emission of fugitive dust in the atmosphere. Respondents explained that even though this may sometimes have a positive impact on the environment, the environmental aspects are frequently not considered when those responsible for reviewing a business's overall supply chain performance make changes in the supply chain.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of research findings, conclusion and recommendations of the study. The research set out to analyze the benefits of GSCM in the Kenyan cement industry. The study endeavored to establish GSCM strategies used by EAPCC in leveraging its operational competitiveness. It also identified the challenges faced by EAPCC in implementing its GSCM strategies.

5.2 Summary

It emerged from the study that corporate-level management formulates and promulgates GSCM strategy to enable the company operate in a 'green' atmosphere. The respondents were unanimous that the company cannot manage its green supply chains without a corporate strategy to guide it. The company introduced the concept of GSCM in 2010 with the primary aim of enabling it to focus more on reduction of fugitive dust, operational cost reduction and the avoidance of conflict with legislative bodies especially NEMA.

Another reason given for formulating GSCM strategy according to the respondents was rising competition in the market and the need to make supply chains lean. Some respondents noted that it is imperative to have a lean SCM in order to be effective. Lean SCM minimizes wastage of resources. The company could therefore adopt GSCM, which is an aspect of lean SCM as a competitive tool to gain greater market share. Apart from complying with environmental regulations and reduction of production costs, the respondents cited forging sustainable relationships with clients/customers as another driver of formulating GSCM strategy. Most customers were aware of the dangers of environmental pollution and were keen to buy products from a company which was seen as doing something to eliminate polluting the environment. Thus, the company will have a sustainable relationship with its customers and suppliers leading to greater revenues in the long run.

The respondents unanimously observed that the formulation of GSCM strategy originates from the need to reduce waste and avoid pollution to the environment. Some senior managers,

however, cited the need to reduce operational costs as well as the need to compete favorably in the market with companies that have adopted the practice. Among GSCM strategies that have been formulated at this stage include quality controls, control of fugitive dusts and avoiding double handling and waste reduction. Out of the total number of respondents interviewed, 53 percent agreed that the strategies were very effective; 41 percent said that the strategies were effective; while 6 percent thought that the strategies were not very effective in achieving the benefits of GSCM. The respondents who argued that the strategies were not effective gave the reason of the company still battling with containing fugitive dust from ESP which ends up in the atmosphere. They further justified their argument by claiming NEMA has already compelled the company to change from ESP to bag-house system which is more effective in filtering dust.

Respondents noted that the main motivating factor in the adoption of GSCM practices was the enhancement of the company's reputation and improvement of the market image. Some respondents added that becoming a market-leader through innovation was also a motivation for taking up GSCM, besides the pressure to follow others who are either partners or competitors. Significant reduction of environmental litigations and compliance with environmental regulations were cited as some of the benefits that accrue as a result of adopting GSCM practices in a company. Moreover, the strategy had worked quite well to help the company minimize court cases and punitive measures imposed by NEMA due to environmental pollution. Respondents were cognizant of the fact that rising environmental pressures and social expectations can be turned to commercial advantage if a strategic approach is taken to develop a "green" supply chain.

Majority of the interviewed senior managers concurred that green supply chain enables optimum utilization of all available productive resources of organizations. By incorporating GSCM strategic thinking through its entire business decision-making process, EAPCC purchases green input resources that flow through environmental friendly production process to produce the desired green outputs. The failure to integrate supply chain optimization efforts with green supply chain efforts emerged as a setback to greening the supply chain at EAPCC. This observation was in agreement with Wilkerson (2003) who had argued that most firms implementing green supply chain practices do not actually integrated environmental

considerations into their supply chain management processes. This is what EAPCC did with its ESP that has not been effective in reducing the emission of fugitive dust in the atmosphere. Respondents explained that even though this may sometimes have a positive impact on the environment, the environmental aspects are frequently not considered when those responsible for reviewing a business's overall supply chain performance make changes in the supply chain.

5.3 Conclusion

This study sought to evaluate GSCM practices in cement industry in Kenya. The genesis of GSCM is the necessity to conserve the environment on whose plane all the activities and processes of production and distribution of goods and services occur. Traditionally, SCM focused on the planning and integration of the network activities that procure raw materials, transform them into finished products, and then distribute to end-user consumers**.** There are two main types of business benefits derived from going green first, there are potential cost reductions where environmental change leads to increased resource efficiency, which in turn leads to improvements to business bottom line and the second relates to customer preferences and enhancing corporate reputation. Effective management of resources and supplies can reduce production costs, promote recycling and reuse of raw materials besides reducing the production of hazardous substances. Given that no study on GSC practices has been carried out at EAPCC, this research purposed to analyze the benefits of GSCM in the cement industry, establish GSCM strategies employed by EAPCC in leveraging its operational competitiveness and in addition identify challenges faced while implementing such strategies.

The study adopted a descriptive research design and heavily relied on primary data obtained through oral interviews with respondents. The population of the respondents comprised all the staff at EAPCC from whom a sample of 79 was obtained through clustering sampling method. The interview guide used to obtain data captured all the relevant questions that would be analyzed to meet the objectives of the study. The researcher used secondary data to complement the results obtained from the interviewees. From the findings of the study, it was observed that the company cannot manage its green supply chain without a corporate strategy to guide it and EAPCC introduced the concept of GSCM in 2010 to enable it focus more on reduction of fugitive dust, operational cost reduction and the avoidance of conflict with legislative bodies. It

also emerged that green supply chain enables the company to keep the environment clean for use by the society from which its customers emerge. Most customers are aware of the dangers of environmental pollution and will be keen to buy from a company which is seen as doing something to eliminate pollution to the environment. Respondents concurred that green supply chains enable optimum utilization of the available productive resources of organizations. By incorporating GSCM strategic thinking in its entire business decision-making process, EAPCC purchases green input resources that flow through environmental friendly production process to produce the desired green outputs.

5.4 Recommendations

From the findings of the study, GSCM is very important for the overall performance of a company. The study established that GSCM enhances the performance of supply chain systems which is the lifeline of operations in any manufacturing company. This study therefore recommends that cement manufacturing companies in Kenya should adopt GSCM practices. These companies should also find appropriate business processes needed in implementing GSCM practices. As already recommended by NEMA, EAPCC should replace its EPS system of emitting fugitive dust with a more effective method, preferably bag-house system since the former has not been effective in reducing air pollution. Moreover, the company should practice waste reduction, re-use and recycling techniques to make its supply chain more effective and environmental friendly.

5.5 Limitations of the Study

The researcher encountered few challenges in carrying out this study. This is because of prior acquaintance with operations of EAPCC which was the field of study. However, vital contributions from some executives and senior managers, which would have added some rich to this study were lacking because most of these managers were too busy for the interviews. Lack of cooperation from sampled population was another challenge encountered during the study.

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APPENDIXES

Appendix I: Interview Guide

EXECUTIVE MANAGERS

SECTION A: BIO PROFILE

1. Name of the respondent (Optional)……..……..
2. Position of the respondent in the company……
3. Respondent's highest level of education?

   First Degree [ ] Master's Degree [ ] Other [ ] (specify)……..

   ……
4. Age of the respondent (optional).……
5. How many years have you worked for EAPCC? …….

SECTION B

6. Has green supply chain management been adopted as a corporate strategy at EAPCC?

7. Most companies are 'greening' their supply chain due to environmental policies, enlightened clientele and perhaps reduction of operational costs. What are the reasons that make EAPCC go green?

8. Among the benefits that green supply chain management can yield is profitability, which obviously is a function of many variables. Do you think GSCM has contributed to profitability at EAPCC? Please explain.

9. Do you consider using GSCM practices as a competitive tool to bolster for a bigger market share in the ever expanding construction industry? If yes, how would you achieve this?

10. Globalization has ensured that companies compete on global arena with Technologies, expertise, clients and suppliers being sourced and reached internationally. What are the challenges of implementing GSCM at EAPCC in spite of the availability of the above variables?

11. Do you have any additional information/comment regarding GSCM practices at EAPCC?

SENIOR MANAGERS

1. Name of the respondent (Optional)…….
2. Position of the respondent in the company…….……
3. What is your highest level of education?
   Diploma [ ] First Degree [ ] Master's Degree [ ] Other [ ] (specify)……..
4. Age of the respondent(optional)…….
5. How many years have you worked for EAPCC? ……..…….

SECTION B

6. This is the level where strategies are formulated before they get to corporate level. What are some of the GSCM strategies that have been formulated at the senior management level?

7. How effective have these strategies been towards the realization of GSCM practices at EAPCC?

8. How many such strategies have been endorsed at the corporate level and adopted by EAPCC? Please mention them.

9. Scholars have researched a lot on the benefits of GSCM practices. Other than compliance with environmental policies, does GSCM have other benefits to EAPCC?

10. What are some of the challenges that the implementation of GSCM poses to EAPCC?

11. What is the structure of EAPCC's green supply chain system? In other words, what constitutes 'green' in the EAPCC supply chain system?

SUPERVISORS

SECTION A: BIO PROFILE

1. Name of the respondent (Optional)…….…….

2. Position of the respondent in the company……..……
3. What is your highest level of education?

   Diploma [ ] First Degree [ ] Master's Degree [ ] Other [ ] (specify).

   ……..……
4. Age of the respondent (optional)……
5. How many years have you worked for EAPCC.....

SECTION B

6. What are the day-to-day activities that demonstrate the adoption of green supply chain management practices at EAPCC?

7. Are the above practices effective in minimizing operational costs and improving the efficiency of the supply chain system? Please explain

8. What are the challenges involved during the implementation process of green supply chain management?

9. Given chance, would you alter or modify the current green supply chain strategies that you are in-charge of implementing? If yes, how?