

**Green Supply Chain Management Practices and  
Challenges: The Case of Coca Cola Beverages Africa  
Addis Ababa Plant**

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**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF COMMERCE**

**DECLARATION**

I, the undersigned, declare that this thesis entitled — *Green Supply Chain Management practices and challenges: the case of Coca Cola Beverage Africa S.c Addis Ababa Plant*” is my original work and has not been presented for degree requirement in any other university, and all the sources used to support this particular study have been appropriately acknowledged.

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**ADDIS ABABA UNIVERSITY  
SCHOOL OF COMMERCE**

**LOGISTICS AND SUPPLY CHAIN POST GRADUATE PROGRAM**

**GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND CHALLENGES: THE  
CASE OF COCA COLA BEVERAGE AFRICA S.C ADDIS ABABA PLANT**

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## **Acronyms**

CCBA- Coca Cola Beverage Africa

CCS- Coca Cola SABCO

CDE-Cold Drink Equipment's

EABSC- East Africa Bottling Share Company

EMS- Environmental Management System

F&B- Food and Beverage

GMP- Green management Practice

GPP- Green Procurement Practice

GSCM- Green Supply Chain Management

GSCP- Green Supply Chain Management Practice

IEM- Internal Environmental Management

ISO – International Organization of Standards

KORE- Coca Cola Requirements

SABCO- South Africa Bottling Company

SC- Supply Chain

SCM - Supply Chain Management

SHEQ- Safety Health Environment and Quality

SPSS- Statistical Package for Social Science

## **Abstract**

*Manufacturer's attention now focuses on the green supply chain (GSCM) due to pressure from the government and environmental consciousness among customers. GSCM practices involve all stages of the product lifecycle such as purchasing, production, distribution, use, and disposal of materials. so it is necessary to study the main practices and challenges for the manufacturing sector. In this research, the food and beverage industry is depicted. The food and drink manufacturing industry is a very diverse sector because of the large range of different products and manufacturing processes as well as the size of companies and production facilities. This industry also generates wastes to the environment through product packaging wastes and from production area wastes and makes social-environmental problems. Therefore, this study aimed to identify the practices and challenges on the implementation of the GSCM in the food and beverage manufacturing sector taking CCBA S.c Addis Ababa plant as a case. This study can be used as a guide for similar and different other industrial sectors. Data are collected through a questionnaire and analyzed using statistical method and interview questions which are analyzed qualitatively. Then, the study showed that CCBA S.c Addis Ababa plant is better on green manufacturing practices, and on the other hand the main challenges those affect company's GSCM implementation pointed out. I have found that technological scarcity and governmental supports are one of the main challenges the company facing on the GSCM implementation. Moreover, unlike other previous studies, the CCBA S.c Addis Ababa plant does not have a lack of top management support and commitment and an awareness gap.*

**Keywords:** Supply chain management, green supply chain management; GSCM; practice and challenges, food and beverage industries.

# Chapter one

## Introduction

### 1.1 Background of the Study

Supply chains have been always considered as the procedures used to transform raw materials to finished products which are then delivered to consumers. Traditionally, supply chain management focuses mainly on the maximization of consumer satisfaction and the increase of business revenue and profitability. However, in recent years, with the emergence of environmental issues, traditional supply chains have been held accountable for generating massive amounts of emissions and waste and resource consumption, contributing to the degradation of the environment and the deterioration of environmental status. Furthermore, supply chains are often accountable for global environmental problems, like global warming, for instance. As a result, environmental sustainability is being intensively integrated with the dominating business practices. To that end, the increasing interest of the stakeholders involved in supply chains on environmental issues led to the development of green supply chains. (Sarkis, J. and Dou, Y., 2017.)

The term sustainable or green supply chain refers to the idea of integrating sustainable environmental processes into the traditional supply chain. This can include processes such as supplier selection and purchasing material, product design, product manufacturing, and assembling, distribution, and end-of-life management. Instead of mitigating the harmful impact of business and supply chain operations, the green supply chain involves value addition and/or value creation through the operations of the whole chain. Undeniably, reducing air and water pollution is the main goal of the green supply chain, while green operations also enhance firms' performance in terms of less waste manufacturing, reuse and recycling of products, reduction in manufacturing costs, greater efficiency of assets, positive image building, and greater customer satisfaction. (Sarkis, J. and Dou, Y., 2017).

Nowadays, the general concern with environmental and health issues is increasing, and all the actors of the food and beverage (F&B) supply chain are required to be more aware of eco-sustainability (Hoffmann, 2007; Yung et al., 2011). Indeed, the interest in green supply chain management (GSCM) is rising. It is often claimed that unplanned and irresponsible actions by industries are potential threats to sustainability (King and Lenox, 2000). To achieve greater sustainable objectives, organizations need to play a vital role and need to be concerned about the external environment, which is often referred to as the 'going green' mission (Bansal and Roth, 2000). The basic ideology behind the green concept is to enhanced

environmental sustainability, but firms adopt the green concept as "kill two enemies with one bullet". Because a green supply chain can reduce environmental pollution and production costs and it also can spur economic growth, create a competitive advantage in terms of greater customer satisfaction, positive image, and reputation and provide a better opportunity to export their products in pro-environmental countries. Cost minimization is considered the most important factor for firms to implement green practices in their supply chain operations. The implementation of green supply chain initiatives would help to cut down the costs of packaging, components, and materials due to the use of reused, recycled, and remanufactured products.

The most common GSCM practices involve organizations assessing the environmental performance of their suppliers, requiring suppliers to undertake measures that ensure the environmental quality of their products, and evaluating the cost of waste in their operating systems (Handfield et al., 2002). Researcher's argued that GSCM practices are examined in a wide range. The limits of GSCM research are based on the researcher's goals as is the case in supply chain management research (Zhu, Sarkis, & Geng, 2005).

### **1.1 Statement of the Problem**

In the last two decades, industrialization has contributed to environmental issues including decreased air quality, climate change, and air pollution-related problems (Khan, Zhang, Golpîra, & Dong, 2018). Additionally, customer pressure, governmental policies, non-governmental organizations (NGOs), society, and the industry itself have influenced organizations to implement green practices in their supply chain and business operations (Tebaldi, Bigliardi, & Bottani, 2018). Furthermore, increasing regulations and public awareness have motivated organizations to minimize economic, environmental, and social risks in supply chains (Josef-Peter Schöggel, M. M. C. Fritz, & R. J. Baumgartner, 2016b).

The need for sustainable performance improvement in organizations has been accomplished through sustainable supply chains. Where a green supply chain plays a key role in sustainability to improve performance (Silva, Gomes, & Sarkis, 2019), motivating organizations to implement green practices throughout each process involved in the procurement of materials, manufacturing, logistics including distribution and warehousing, and customer service as being part of the supply chain (Chopra, 2018). Therefore, green supply chain management has become a critical strategy for protecting and minimizing the

supply chain operations' negative impact on the environment (Boutkhoul, Hanine, Boukhriss, Agouti, & Tikniouine, 2016; Silva et al., 2019).

It is important to integrate environmental management practices into the entire supply chain to achieve a greener supply chain and maintain competitive advantage (Rao and Holt, 2005; Linton et al., 2007). Accordingly, Srivastava (2007) defines GSCM as “integrating environmental thinking into supply chain management, 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”. According to Rao and Holt (2005), GSCM practices should cover all supply chain activities, from green purchasing to the integration of life cycle management, through the manufacturer and customer, to closing the loop with reverse logistics. Several green practices at the product level are described in the literature, including eco-design (Linton et al., 2007, Zhu et al., 2008b) and design for product recyclability (Chen and Sheu (2009). Another practice that is commonly referred to is reverse logistics (Srivastava, 2007; Pochampally et al., 2009; Chanintrakul et al., 2009).

Since CCBA is found in the middle of the capital Addis Ababa there should be much to be expected from the company's environmental concern because any irresponsible or unplanned activity on sustainability could cause bigger damage to the environment and health of the society and also company brand and image. Coca-Cola beverage Africa is one of the fastest-growing company in Ethiopia besides Dire Dawa and Addis Ababa plant in 2017 Bahirdar plant start production with an additional line started this year and in 2021 Sebeta plant will be expected to start production which can raise the capacity of the company to 100-million-unit cases a year. For instance, last year the company plant to deliver 50-million-unit cases of product and end up delivering 45-million-unit cases, and this year the company plans to deliver 85-million-unit cases of product. And from all these products 35-40% of the product is PET-packed products (have a plan to collect and recycle 75% plastic bottles) and the rest are returnable glasses that need to be collected after use. Although Products have a short shelf life for instance normal beverages with 365 days, reduced sugar beverage products with 270 days, and all pet products with 120 days of shelf life. That means if the products pass this shelf life it needs to be collected and need to be disposed of. The company has a lot of wastes coming from production areas that mainly used in returnable glass washing and for cleaning that needs to be treated before released to the river (source internal communication and my working experience). The purpose of this study is to assess how Coca Cola Beverage Africa

is integrating its actions with these environmental and ecological concerns which are referred to as "Green Supply Chain Management" which believes to Assess all the Company's effort on Green Purchasing, Green manufacturing, and also Green Distribution practice, which includes reverse logistics.

In this paper, GSCM practices are considered to be any action that is performed across the supply chain (inward to the focal company and involving relationships with partners upstream and downstream) to eliminate or reduce any kind of negative environmental impact

Therefore, the GSCM practices can be identified at the strategic, tactical, or operational level and could be related to the delivery process and loop closing reverse logistics activities.

The purpose of this research study will be to assess the practices of coca-cola beverage Africa in implementing green supply chain management in its business and to find out what happened as a challenge in GSCM implementation within the supply chain. To fulfill this purpose, a mixed research design is surveyed on CCBA's Procurement staff, manufacturing staff (SHEQ team), and logistics. Effective green supply chain management practices in organizations require a total understanding of the day-to-day operation, collaborating with suppliers and customers, and cooperate with associations engaging themselves with environmental issues.

The contribution of this paper is justified by the fact that it addresses an emerging topic in a structured research framework, specifically in the context of the Ethiopian food industry, regarding the existing practices and challenges to the adoption of GSCM practices in the CCBA Addis Ababa plant.

The study will try to fill the gap shown in the scare of shreds of evidence in Green Supply chain management implementation in Ethiopia taking CCBA, Ethiopia, Addis Ababa Plant as a case. This can be help full for similar or related companies and Practitioners who try to Study this matter.

#### **1.4 Research Question**

- How do the CCBA Addis Ababa Plant's Green Purchasing Practices look like? And what are the main challenges in green purchasing?
- How is the CCBA Addis Ababa Plant's Green Manufacturing Practice (GMP) look like? And what are the main challenges in GMP?

- How the CCBA Addis Ababa Plant's Green Distribution and Reverse logistics Practice look like? And what are the main challenges in green distribution and reverse logistics practices?

## **1.5 Research objectives**

### **1.5.1 General Objectives**

The general objective of the study is to assess the practices of green Supply chain management in the CCBA Addis Ababa Plant.

### **1.5.2 Specific Objectives**

- To assess the CCBA Addis Ababa plant's green purchasing practices and challenges.
- To describe the CCBA Addis Ababa plant's green manufacturing practice (GMP) and challenges.
- To appraise the CCBA Addis Ababa plant's green distribution and reverse logistics practice and challenges.

## **1.6 Significance of the Study**

Market changes are leading companies to move from a standard supply chain to a green supply chain driven by the criterion of eco-efficiency. Thus, the environmental dimension is integrated into the supply chain not just by reducing waste and dangerous substances, but through new production processes, new product designs, and purchasing policies that respect the environment. The study will try to show CCBA s.c Addis Ababa plant's effort on the implementation of GSCM in its business and the effort for developing a green image for the company by exposing the practices and challenges of the company in the Addis Ababa plant.

## **1.7 Scope of the Study**

The study sought to examine GSCM practices in CCBA in Addis Ababa Plant. According to Hervani, A.A., Helms, M.M. and Sarkis, J., 2005 GSCM is mainly described at four levels: green procurement; green manufacturing, green distribution and reverse logistics. Thus, the study will mainly focus on GSCM Practices and challenges in these three departments of CCBA of Addis Ababa Plant. This means that the study will not assess the topic in other related companies and only focuses on the Addis Ababa plant so it does not include other plants Such as Dire Dawa, Bahirdar, and also Sebeta Plant.

## **1.8 Limitation of the Study**

The main limitation of the study is that scare of previous studies and evidences in GSCM practices in the Ethiopian context especially in the food and beverage sector and within the company there is no specific department that work on sustainability other than SHEQ (Safety

health environment and quality) which only focus on occupational safety and waste management and product and package quality.

The other limitation is that external factors like customers and regulatory bodies will not be taken into consideration even if in green supply chain management, customers and regulatory bodies play an important and effective part by exerting heavy pressure to adopt green practices in their business operations.

### **1.9 Organization of the Study**

The study is organized into four chapters. The first chapter deals with the background of the study, statements of the problem, the objective of the study, the research questions, and scope and significance of the study, the limitations of the study, and definitions of terms and organization of the research. The second chapter presents a review of previous related research done on the area of the topic. The third chapter explains the types and sources of data used for the study, sampling techniques that used to determine the sample size, method of statistical data analysis tools and collection to be used. Finally, the last chapter is present the activities performed with the detailed schedule and the research costs to conduct the research successfully

## **Chapter Two**

### **Related Literature Review**

#### **2.1 Supply chain management**

Supply chain management gained popularity in the early 1990s, as it evolved in both the academic and the practitioner contexts. Lyons, K., (2015), the network created among companies producing, handling, and/or distributing a product. Specifically, the supply chain encompasses the steps it takes to get a good or service from the supplier to the customer. Supply chain management is a crucial process for many companies, and many companies strive to have the most optimized supply chain because it usually translates to lower costs for the company.

Traditional supply chain management focuses on cost, time, and quality but, nowadays, it has been extended to integrate environmental and social dimensions. This development is often part of a response to legal constraints and/or consumer pressures. Nevertheless, companies increasingly go beyond adaptation by considering, as part of a proactive response, that taking environmental and social conditions into account in the supply chain management brings a critical, strategic advantage to the company's competitiveness (Zhu et al., 2008).

The traditional supply chain management description by Handfield and Nichols (1999) implies a linear relationship with flows up and down the supply chain. As environmental issues and sustainability become more integrated, the supply chain will need to become more circular and nonlinear, where loops may not necessarily return to the beginning of a supply chain but can occur anywhere within the supply chain.

#### **2.2 Green Supply Chain Management**

The concept of GSCM can be found in the early 1990s, the trend in the growth of academic publications shows that it gained popularity after 2000 (Fahimnia et al., 2015; Seuring and Müller, 2008); (Srivastava, 2007). Moreover, Sarkis et al. (2011) maintain that the concept of GSCM can be traced back to the 1960s as environmental management movement. About that, Seuring and Müller (2008) narrated that the GSCM concept found its formal shape as a new discipline after the 1990s. Thus, the concept of green supply chain management has been evolving for years. Handfield et al. (1997) mention the application of environmental management principles to the entire set of activities across the whole customer order cycle.

Sarkis et al. (2011) defined GSCM as integrating environmental concerns into the inter-organizational practices of sustainable supply chain management, including reverse logistics.

In general, it can be said that the concept of GSCM is broad, and there is no clear, holistic definition available to describe it. Since the concept is defined differently by researchers, it is difficult to describe GSCM by a single definition (Ahi and Searcy, 2013). Although there are differences among the definitions, there is clear usage of several common terms (Sarkis et al., 2011) such as 'supply chain environmental management' (Sharfman et al., 2009), 'green purchasing and procurement' (Min and Galle, 1997), 'green logistics and environmental logistics' (Murphy and Poist, 2000), and 'sustainable supply network management' (Young and Kielkiewicz-Young, 2001). Zsidisin and Sifer (2001) defined green supply chain management as the formation of supply chain management policies during the design, distribution, use, recycling, and disposal of company products and services by considering the natural environment. Srivastava (2007) stated that green supply chain management includes green design, green purchasing, green production, green distribution, logistics marketing, and reverse logistics activities. Walker et al. (2008) expressed that GSCM practices involve all stages of the product lifecycle such as purchasing, production, distribution, use, and disposal of materials. Handfield et al. (1997) suggest that environmental sustainability efforts be integrated throughout the value chain. Linton et al. (2007) assert that the focus of environmental management has moved from the organization level to the supply chain level. Whether going “green” really pays has been investigated with inconclusive results (King and Lenox, 2001; Rao and Holt, 2005; Zhu and Sarkis, 2004).

### **2.3 GSCM in Food and Beverage Manufacturing Sector**

The food and drink manufacturing industry are a very diverse sector because of the large range of different products and manufacturing processes as well as the size of companies and production facilities. Moreover, key environmental impacts are not only linked to the manufacturing itself, but also upstream and downstream processes and, in particular, to the primary production of raw materials.

A Kamolkittiwong, B Phruksaphanrat - Sari, (2011), GSCM comprises the manufacturing process that minimizes waste and pollution. It also integrates environmental thinking in supply chain management, from conceptual product design to the delivery of the final product to the consumers, and also involves end-of-life management. GSCM emphasizes the concerns for the environment along the whole supply chain and requires long-term and strategic collaborations between the supply chain members. Syed Abdul Rahman Khan (2018),

by adopting GSCM practices, firms may enhance their operational performance through improving product quality and improving delivery service. Green supply chain management initiatives also help organizations to improve their environmental performance such as the reduction in carbon emissions, elimination of waste from the end-to-end supply chain, effective and strong collaboration with suppliers would decrease their communication costs and easily promote reuse, recycling, and remanufacturing. Environment management system (EMS) integrated into firms' manufacturing strategy will assist the firms to enhance their ecological performance.

## **2.4 GSCM Practices**

Srivastava (2007) stated that green supply chain management includes green design, green purchasing, green production, green distribution, logistics marketing, and reverse logistics activities. Walker et al. (2008) expressed that GSCM practices involve all stages of the product lifecycle such as purchasing, production, distribution, use, and disposal of materials. GSCM practices host various activities like design, supply, production, assembly, packaging, logistics, and distribution (Handfield, Walton, Seegers, & Melnyk, 1997; Eltayeb & Zailani, 2009). Therefore, it can be argued that GSCM practices are examined in a wide range. The limits of GSCM research are based on the researcher's goals as is the case in supply chain management research (Zhu, Sarkis, & Geng, 2005). Hence, there is no consensus in the literature regarding the dimensions of green supply chain management (Eltayeb & Zailani, 2009).

### **2.4.1 Green Purchasing**

Traditionally, purchasing was regarded as being a supporting service to production in achieving a company's corporate goals (Green et al., 1998). However, since the 1980s global competition has intensified, firms recognized the impact of the high volume of purchased materials and work-in-process inventories on operation cost, product quality, and delivery lead time (Wisner et al., 2012). Nowadays, the purchasing department is a key business participant in a supply chain that connects a firm with its suppliers through the acquisition of required materials, services, and equipment for production processes (Zsidisin & Siferd 2001; Yang & Zhang, 2012; Olaore & Adebisi 2013). The main goals of purchasing include ensuring smooth flows of raw materials at the lowest total cost, maximizing customer satisfaction, and improving the quality of the finished goods (Wisner et al., 2012). Purchasing can contribute a significant environmental threat in terms of discarded packaging materials. Over time, the level of awareness on global warming and other environmental issues has

increased significantly, making concern for companies to “green” their purchasing. According to Wu (2008), green purchasing takes into account the environmental and social responsibility in the purchasing process. The environmentally-conscious purchasing initiatives include the procurement of products and services that meet environmental objectives such as reduced sources of wastages, recycling, reuse, resource reduction, and substitution of materials (Carter et al., 1998; Min & Galle, 2001; Zsidin & Siferd, 2001; ElTayeb et al., 2010). In a similar vein, ElTayeb et al. (2010) and Yang and Zhang (2012) claimed that green purchasing is the practice of choosing suppliers that provide eco-friendly materials and services. Green purchasing aims to minimize negative environmental impacts in the manufacturing process and transportation by using durable, recyclable, and reusable materials (Sarkar, 2012). Companies that practiced environmental strategy in purchasing benefitted from cost savings, better public image, and decreased liability (Wisner et al., 2012). (According to Lee (2008), to ensure that suppliers meet their environmental objectives, the buying firm may deploy collaboration-based activities that include training, environmental information sharing, and joint research. Other organizations may adopt a less collaborative approach by simply demanding that their suppliers adopt environmental systems such as ISO 14001. Like Vachon (2007) and other literature believes that external motivators and particularly, customer pressure are key drivers of the adoption of ISO 14001. Other aspects of green purchasing that have been discussed in the literature include the facilitation of recycling, reuse, and resource reduction (Large & Thomsen, 2011). There is also evidence that some organizations adopt compliance and evaluative approach to the GSCM practices of their suppliers. This involves evaluation of suppliers based on environmental criteria and a requirement for suppliers to develop and maintain some form of the environmental management system (Sarkis, 2012). (Colicchia, Melacini, & Perotti, 2011), summarized the practices that can be used to minimize environmental impact in the context of green purchasing approach are

- a. Working with suppliers that have obtained environmental certificate’s such as ISO 14001 and environmental management system (EMS)
- b. Auditing the supplier
- c. Purchasing products with eco-labels
- d. Taking environmental criteria into consideration in the supplier evaluation system
- e. Cooperating with the supplier in environmental issues.

#### **2.4.2 Internal Environmental Management (IEM) / Environmental Management System**

Internal environmental management is the generation of environmental protection policies and environmental objectives by the company itself to ensure environmental conservation (Chan, He, Chan, & Wang, 2012; Darnal et al., 2008). This concept is a systematic process that includes evaluation of the product's environmental impact and the related responsibilities (Darnal et al., 2008).

Internal environmental management (IEM) is a prerequisite for all GSCM practices. IEM is the practice of developing GSCM as a strategic organizational imperative through commitment and support from senior and mid-level managers (Zhu et al., 2008). He validated the importance of IEM in GSCM through various case studies. The IEM consist of, but not limited to cooperation, commitment, and communication between top management, senior and middle managers, implementation of EMS and ISO14001 certification, environmental compliance auditing programs, cross-functional integration for environmental improvement, advanced information technology, training for staff and proper allocation of human resources, health and safety compliance, tracking sustainability and measuring key performance indicators (KPI).

An EMS consists of a collection of internal policies, assessments, plans, and implementation actions (Coglianese and Nash, 2001) affecting the entire organization and its relationships with the natural environment. EMSs are intended to help organizations embed environmental practices deep within their operational frameworks so that protecting the natural environment becomes an integral element of their overall business strategy (Shireman, 2003). Once an organization implements an EMS, it may elect to have it certified to the ISO 14001 standard. Developed by the International Organization for Standardization (ISO) in 1996, ISO 14001 adoption requires certification by an independent third-party auditor, who helps to ensure that the EMS conforms to the ISO 14001 standard. In preparation for certification, an organization must characterize the procedures and plans that form its EMS. Once certified, the ISO 14001 label indicates that the organization has implemented a management system that documents the organization's pollution aspects and impacts, and identifies a pollution prevention process that is continually improved over time (Bansal and Hunter, 2003; Darnall, 2006). Organizations that adopt EMSs, regardless of their form, can benefit from improving their regulatory compliance, which in turn can enhance their corporate image and increase profits (Stapleton et al., 2001). EMSs are strategic management approaches that define how an organization will address its impacts on the natural environment research has evaluated the

reasons why organizations adopt an EMS and the potential these environmental strategies have for improving the environment (Bansal and Hunter, 2003; Darnall, 2006), questions remain about whether organizations are using their EMSs to challenge their supplier networks to become more environmentally sustainable. At issue is that EMSs do not require organizations to improve their environmental performance, but instead focus on creating and documenting environmental policies and procedures (Krut and Gleckman, 1998). Additionally, there is no way of externally verifying that an organization's environmental performance improvements occur (Rondinelli and Vastag, 2000). EMSs therefore may represent only symbolic efforts to improve an organization's image (Bansal and Clelland, 2004). In instances where EMSs enhance an organization's environmental performance (Potoski and Prakash, 2005; Khanna and Anton, 2002; King et al., 2005), some scholars suggest that improvements are likely to occur within the organization's operational boundaries rather than being extended throughout the supply chain (Handfield et al., 2004). Moreover, EMS adopters may have little reason to 'green' their supply chains, since they can market themselves as being environmentally proactive (by having an EMS) without undertaking these additional efforts

Despite these concerns, the operational capabilities necessary to adopt an EMS may also assist an organization's efforts to reduce its environmental impacts throughout its supply chain (Sarkis, 2001).

According to Darnall, N., Jolley, G.J. and Handfield, R., 2008. EMS adopters may be more likely to rely on their complementary knowledge-based capabilities towards working with their networks of suppliers and customers to minimize system-wide environmental impacts. In other instances, organizations that chose to adopt an EMS may endure the same institutional pressures as organizations that adopt GSCM practices, which is why they utilize both environmental management practices simultaneously. Regardless of the nature of their potential complementarity, organizations that adopt EMSs may have a greater probability of implementing environmentally sustainable management practices by considering their environmental impacts beyond their organizational boundaries.

According to Preuss, 2005, the relationship between EMSs and GSCM practices has potentially complementary and significant implications for an organization's environmental sustainability, because together they offer a more comprehensive means of defining and establishing sustainability among networks of business organizations. However, when EMSs

are adopted in the absence of GSCM, environmental benefits are likely to diminish. This is because the organization's supply chain network does not share its environmental goals, and environmental sustainability of any organization is impossible without incorporating GSCM practices. For instance, an organization may adopt an EMS and significantly enhance the environmental performance within its organizational boundaries, but its suppliers may not do the same.

- a) **Support for Environmental Practices by Senior and Mid-Level Administration:** Senior management support is a crucial driving force to successfully implement environmental innovations, technologies, and activities (Hamel & Prahalad, 1989).
- b) **Interdepartmental Cooperation for Environmental Improvements:** Since GSCM closely concerns all departments in the organization, interdepartmental cooperation and communication are necessary elements for successful environmental practices (Zhu & Geng, 2001; Aspan, 2000).
- c) **Establishing an Environmental Management System:** Environmental management systems such as ISO 14001 help the development of the environmental performance of the company by decreasing its environmental impacts. These systems also act as proof of environmental policies followed by companies (Teixeira, Jabbour, & Jabbour, 2012).

### **2.4.3 Green Production**

Green production is one of the most important stages in green supply chain activities. Green production is adopting and planning the production technologies and processes that will ensure using less energy and resources and result in minimal environmental pollution (Gao, Li, & Song, 2009). Green production processes seek to minimize the impact of the manufacturing process on the environment at every stage. (Zinkhan, G.M., Les Carlson, 1995), agreed that green production worried about more than just the purchase and the consumption processes. They are also concerned about the production process, in terms of scarce resources consumed. In short, green production aims to produce environmentally friendly products with the least amount of resources (materials, energy, and water) and waste (Routroy, 2009). Green production may facilitate reducing the cost for raw materials, increasing production productivity, and reducing environmental costs and costs related to occupational safety (Atlas & Florida, 1998). And according to (Shrivastava, P. and Hart, S., 1994) green production focuses upon three fundamental goals: 1) minimize emissions, effluents, and accidents; 2) minimize the use of virgin materials and non-renewable forms of

energy; and 3) minimize the life-cycle cost (cradle to grave) of products or services. From the literature, practices that can be implemented about green production process are

- a) **Decreasing Input Resources:** Green production can be thought of as an environmental strategy used by the company to increase environmental productivity by decreasing input resources to obtain the same output. These practices will develop both economic and environmental performances of companies (Tsoufas & Pappis, 2006)
- b) **Decreasing Dangerous Emissions:** Waste management and greenhouse gas emissions are basic problems these days. Greenhouse gas emissions generally contain carbon dioxide and equivalent gases. Researchers mostly focus on CO<sub>2</sub> emissions because CO<sub>2</sub> emissions have considerably increased as a result of human activities and global warming has become a threat (Wiedmann, Minx, Barrett, & Wackernagel, 2006; Matthews, Hendrickson, & Weber, 2008).
- c) **Decreasing or Preventing Waste:** Decreasing the amount of waste is an important dimension of green production. In recent years, companies have focused on disposing of waste via practices such as reuse and recycle. Waste can be managed with the help of waste prevention, waste control, and waste reduction strategies (Routroy, 2009).

#### **2.4.4 Green Packaging**

According to Kotler, packaging can be defined as “all the activities of designing and producing the container for a product” (Pathak, 2014, p. 61). According to Manalili et al. (2014, p. 4), “packaging refers to the technology and material for enclosing or protecting products for distribution, storage, sale, and use”. Packaging is defined by two main factors: functionality and point of destination (Arikan, 2011). Packaging plays a significant role in a supply chain ranging from materials handling and inbound logistics operations, purchasing, manufacturing, warehousing, transportation, and retailing (Verghese & Lewis, 2007). Packaging is important in the communication with consumers, in building a relationship with them, in influencing their purchasing decisions, the promotion of the products and the brand values, as well as in differentiating a product (company) from the competitors (Ford et al., 2012; Magnier and Schoormans, 2015). In addition, packaging has an impact on the nutrition aspects of the products, due to the interaction of the products’ compounds with the packaging material (Eilamo et al., 1998). Some packaging materials may result in the development of bacteria, which may cause severe human infections (Nakazato et al., 2017). However, the packaging is important for the preservation and storage of the products, as well as for its

transportation across the supply chain and its disposal to the end-consumers (Magnier and Schoormans, 2015; van Herpen et al., 2016). Thus, modern packages should be appealing, and safe at the same time, especially since consumers require the companies to adopt an eco-friendly process and to be offered products that can be consumed without delay and negative effects for their health (Lamberti and Escher, 2007). From this point of view, sustainable packaging can be an important tool for obtaining a competitive advantage, building and communicating brand value, and influencing consumer behavior (Delgado et al., 2013; Jerzyk, 2016). Besides, it is supported that innovation in sustainable packaging, or else eco-packaging, is an important strategy in building brand loyalty and attracting consumer preference (Jiménez-Guerrero et al., 2015).

However, according to Fitzpatrick et al. (2012) packaging system is defined in terms of the role it serves at the various stages in the supply chain. In general, the packaging is classified into three categories (Livingstone & Sparks, 1994).

- a) **Sales Packaging (Primary Packaging):** It is the first packaging that directly surrounds the product. Plastics bottles of shampoo, metal tubes of toothpaste, and milk bottles can be given as examples of that type of packaging. (Livingstone & Sparks, 1994).
- b) **Secondary Packaging:** It is the packaging that protects the primary packaging and is thrown when the product is used. Carton containers that hold toothpaste tubes are the best examples of that type of packaging (Livingstone & Sparks, 1994).
- c) **Transportation Packaging (Loading and Shipping):** These are parcels, boxes, cartons, crates, wagons, and containers that help storage, carrying, and identification (Livingstone & Sparks, 1994)
- d) **Reducing the amount of packaging:** It is necessary to reduce the amount and weight of packaging to increase the productivity of the supply chain and decrease the amount of waste (Colicchia et al., 2011).
- e) **Packaging to allow reuse:** It is possible to design packaging in a manner that enables them to be reused (Colicchia et al., 2011; Livingstone & Sparks, 1994).
- f) **Using materials for packaging that will allow recycling:** recycling is the inclusion of used products in the production process again after operations such as collecting the components and materials, disassembling them when necessary, classifying them in specific classes (such as paper, glass), and various treatments (Beamon, 1999).

### **2.4.5 Green Distribution**

Distribution is regarded as one of the main sources of environmental problems (European Commission, 2001). Greenhouse gases such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrogen oxide (N<sub>2</sub>O) cause global warming and many of these gases are created by the tools used during transportation activities. According to Al-Odeh and Smallwood (2012), the key issues in distribution are the transportation of goods and services and factors like fuel, modes of transport, infrastructure, and operational practices are important factors to consider in developing green transportation. Vehicles powered by gasoline and diesel emit carbon dioxide, which causes global warming and acid rain. Further, the use of fossil fuels contributes to the increasing scarcity of these fuels. Businesses can thus adopt sustainable practices by using fleets run by alternative fuels. Also, businesses can use alternate transport methods, such as rail instead of using company fleets to transport materials. Businesses can also implement new operations, such as building distribution centers closer to where they deliver or form partnerships with local merchants and distributors to reduce the miles they must drive. This will improve operational excellence by reducing waste, enhancing the resources available. This should translate into bigger profits and a competitive position. Amemba et al. (2013) suggest that Better packaging and rearranged loading patterns reduce the use of materials, as well as increasing warehouse and trailers utilization. This also reduces the amount of handling required. Both studies indicate that green packaging involves the use of packaging the goods into smaller units to reduce the amount of space and the materials used hence increasing warehouse utilization.

#### **a) Providing Efficiency in vehicles**

- Use of vehicles that contain technological innovations. Preference for vehicles with high energy efficiency and low fuel use (McKinnon, 2010; Aronsson & Brodin, 2006).
- Regular vehicle maintenance and disposal of old vehicles in the least harmful manner to the environment (Wu & Dunn, 1995).
- Use of alternative fuels (Langley & Capgemini, 2008) (for instance first and second-generation biofuels, compressed natural gas).

#### **b) Selecting Green Transportation Modes (Wu & Dunn, 1995; Vannie wenhuysse, Gelders, & Pintelon, 2003)**

c) **Logistics Optimization** This practice aims to shorten traveling distance. Practices that can be used are as follows;

- Combing transportation (Aronsson & Brodin, 2006; Langley & Capgemini, 2008).
- Increasing the degree of vehicle usage (Wu & Dunn, 1995; McKinnon, 2000). Increasing the degree of vehicle usage helps both to decrease the environmental impact caused by the distribution and to reduce costs. The vehicles are used under their capacity when empty spaces are left in the vehicles due to unsuitable packaging or empty vehicles are sent due to erroneous routing (McKinnon, 2000).
- Redesigning the logistics network (Murphy, 1994; Van Hoek, 1999; Murphy & Poist, 2000)

#### 2.4.6 Reverse Logistics

Reverse logistics involves activities that aim to reverse products or materials for reuse, recycle, re-manufacturing, repair, refurbish and safe disposal (Beamon, 1999; Carter & Ellram, 1998; Sarkis, 1998; Hervani et al., 2005; Eltayeb et al., 2011; Rostamzadeh et al., 2015). In the first stage, reverse logistics includes moving goods from the last user to the producer. The next stage includes transforming the returned goods into a product that can be used by the producer again (Fleischmann et al., 1997). Reverse logistics involves the transportation and stock management process of traditional logistics. However, it focuses more on the return of the goods from the consumers rather than product mobility for consumers (Eltayeb et al., 2011). One of the most important issues in creating a reverse logistics system is identifying the product recycling option. Although there are many, the most often used recycling options are provided below (Kim, Song, Kim, & Jeong, 2006)

- a) **Reuse:** Products can be used again and again after they are cleaned. Containers and bottles can be given as examples of reuse (Kim et al., 2006).
- b) **Repair:** It includes repairing the parts of the product that are malfunctioning.
- c) **Refurbishing:** It is the process of bringing specific quality standards to the used product.
- d) **Remanufacturing:** The product is disassembled in this option. The parts that can still be used are cleaned and renewed. Then the new product is assembled again from the old parts and, when necessary, new parts. (Kim et al., 2006).
- e) **Cannibalization:** It involves taking some parts of the used product for repair, refurbishing, and remanufacturing.

f) **Recycling.** It involves the collection, disassembling (when necessary), classification into specific groups (such as paper and glass), and inclusion of used products in the production process again after various treatments (Beamon, 1999). It is recycling without conserving the structure of the product. Glass, paper, and plastic can be given as examples of materials that are recycled (Fleischmann et al., 1997).

## **2.5 Challenges in Adopting GSCM**

Environmental issues have become more relevant in manufacturing firms. So that, identifying the barriers faced by manufacturing firms is critical. Because to attain an environmentally sound supply chain in the manufacturing industry, challenges faced while implementing GSCM must be avoided. GSCM continues to be an important research agenda among researchers. However, there is still limited of studies to investigate barriers to implement GSCM adoption in developing countries (Aslinda et al., 2012). Hassini et al. (2012) suggest that the significant upfront cost of greening is the major challenge faced by industries. Muduli et al. (2012) have also stressed how managers in firms are unaware of the advanced technologies available and hence are not in a position to adopt green practices. There is a need for substantial funds to support the infrastructure and manpower requirements of GSCM (Mudgal et al., 2010). GSCM requires skilled professionals both inside the organization as well as throughout the supply chain. Skilled professionals can adapt to the changes quickly, learn new technologies, share ideas and solve environmental problems (Yu Lin and Hui Ho, 2008). So having skilled professionals is essential for the adoption of GSCM. Since the adoption of GSCM will not deliver immediate financial benefits, many companies are reluctant to invest in GSCM (Nidumolu et al., 2009). There are a variety of other related expenses when considering green changes, specifically to manufacturing processes. Green materials tend to be more expensive and raise the product's overall cost (Hoffman, 2008). Hence, having sound financial resources at the beginning is important for the adoption of GSCM. Husted (2003) identified the availability of funds as an important enabler of GSCM. The benefits of GSCM are only in the long run (Testa and Iraldo, 2010). Various firms are jointly prompted to become more aware of their environmental problems of external factors (Sarkis, 1998; Hervani et al., 2005). Lee (2008), suggested that the size of the firms plays a major role in determining the barriers to the implementation of GSCM. Standardization of industrial processes is another major factor that affects the decision of the Industry to implement GSCM. Vachon and Klassen (2008) have established that the adoption of ISO is significantly related to the greening process in a firm. Muduli et al. (2012) classified the

barriers into four main heads viz.: information gap (awareness of top management about new technology, awareness of workers about hazards, etc.), lack of societal pressure (pressure from customers and market), poor legislation (government policies, standardization) and capacity constraints (financial constraints).

## **2.6 Empirical Literature Review**

On the study of Frederick, H. and Elting, J., 2013. Focused on the determinants of green supply chain implementation in the food and beverage sector in New Zealand, despite being in the same industry the research has shown that each examined company is in a different situation, with different factors influencing their environmental approach. Nevertheless, one core characteristic should be to include environmental strategy in the general company strategy to achieve consistency across the entire operations. This facilitates the achievement of a competitive edge over their competitors and all the studied companies state that top-management support is crucial for the success of a GSCM strategy. They have to back the sustainable approach and show commitment. Furthermore, it is their job to promote the implementation of systems to bring in the concept of sustainability in all layers of the company on a strategic and operational level. Decision-making in each company is based on monetary considerations. Increased efficiencies through environmentally-friendly practices lead to cost savings.

The study from Japan was conducted by Arimura et al (2011). Determined the influence of ISO 14001 certification on the green supply chain management (GSCM) by using Japanese facility-level data. The study proved that ISO 14001 and also voluntary EMS government programs are significantly influenced GSCM practices.

Darnall, N., Jolley, G.J., and Handfield, R., in 2008 conducted a study on EMS and GSCM complements on Sustainability and their research revealed that organizations that adopt EMSs more frequently implement GSCM practices, regardless of how long the EMS has been in place. These results suggested that EMSs and GSCM may complement each other and that EMS adopters have a stronger probability of improving the environment not just within their organizational boundaries, but throughout their network of buyers and suppliers. The net effect may be an overall increase in environmental sustainability since mechanisms are in place to enhance network-wide environmental performance.

Vijayvargy, L., Thakkar, J. and Agarwal, G., 2017. Studied Green supply chain management practices and performance. The paper investigated the impact of organizational size on the

adoption of green supply chain management (GSCM) practices for Indian industry and also evaluated the impact of GSCM practices on organizational performance and The study revealed that the Indian organizations have shown a satisfactory implementation of the majority of the environmental practices except for supplier ISO-14001 certification and Tier-II supplier evaluation. Out of twenty-one practices, medium-sized organizations have adopted GSCM practices at a similar level as compared to large organizations, with three exemptions, existing environmental management systems, support from mid-level & top management, and supplier evaluation for environmental practice. The study also noticed that GSCM adoption can bring equal improvement in operational performance for both large and medium-sized organizations.

Another study from Japan by Zhu et al. (2010) sought to introduce environmental, green supply chain management experiences of large Japanese manufactures. This work shows that large companies can green their supply chain by creating win-win relationships with their partners, and hence realize sustainable growth for the entire supply chain. Besides, the study also indicated that suitable regulations and policies set by the government can help GSCM circulation from larger leading companies to smaller companies.

Mignot Desalegn in 2017 Study on the Barriers in Implementing Green Supply Chain Management in Manufacturing Industries: A Case Study of Ethiopian Leather Industries and Concluded her study in the following points

- The managers have an understanding of environmental issues however they are in a delinquent situation regarding environmental sustainability with economic growth, there has been a tilted approach to the economic benefit rather than environmental issues because of the strong desire for economic growth.
- Since they incur a lot of cost of production they do not want to bear an additional cost to the environment.
- Lack of alternate technology has the greatest impact on the implementation of green supply chain management in manufacturing industries.

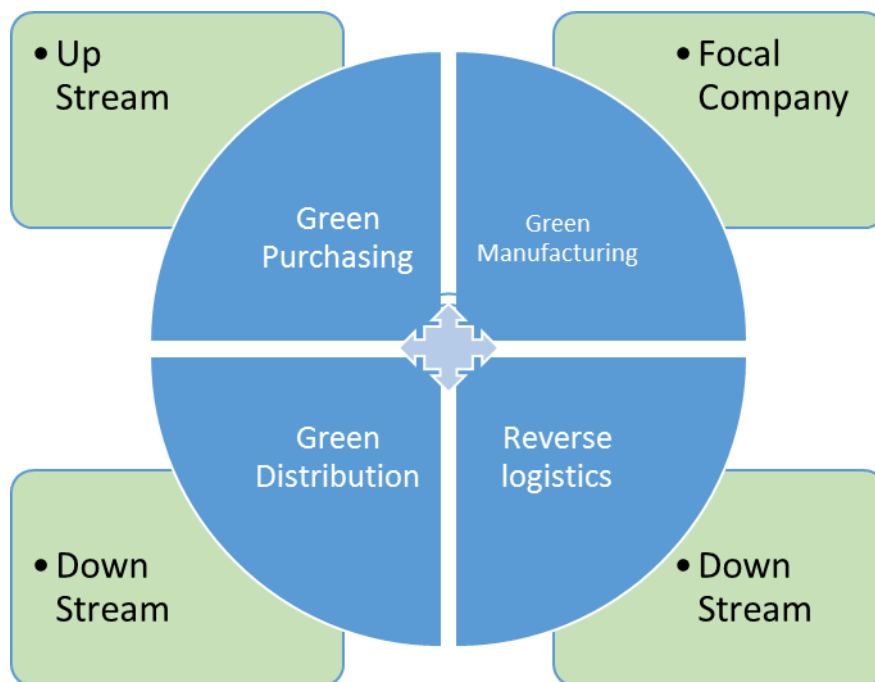
Gábríel (2016) examined the barriers of green supply chain management in the Hungarian automotive. The finding of this study shows that economic reasons (high investment needs and cost pressure from customers) are the main barriers of GSCM.

Wang, Mathiyazhagan, Xu, & Diabat (2016) identified the key barriers to the implementation of GSCM in the food packaging company using a DEMATEL approach. In this study, several factors that act as barriers to the implementation of Green Supply Chain Management (GSCM) were identified. The results of this study confirm that lack of adequate training and progress monitoring, as well as poor customer awareness and lack of pressure for widespread adoption of GSCM, are among the most influential barriers.

According to Luthra, Kumar, Kumar, & Haleem, 2011 the challenges of implementation of GSCM in the Indian automobile industry are lack of IT implementation, poor quality of the human resource, lack of government support, lack of top management commitment, resistance to advancement adoption, cost implications and lack of competition and unwariness of customers.

### 2.7 Conceptual Framework of GSCM Trends

From the literature that is reviewed so far, a conceptual framework has been driven for the main Practices of GSCM in a company.



Source: Adopted from Hervani, A.A., Helms, M.M. and Sarkis, J., 2005

Fig 1 Framework of GSCM practices

## **Chapter Three**

### **Research Design and Methodology**

#### **3.1 Introduction**

This chapter sets out the methodology that used for the study. It involved a blueprint for the collection, measurement, and analysis of data. It is important to have consistency between research questions, the research methodology, and theoretical approaches. Research strategy is one of the components of research methodology. Research strategy provides the overall direction of the research including the process by which the research is conducted (Churchill & Sanders, 2007).

#### **3.2 Description of the study area**

The study area focuses on assessing the green supply chain management practice of Coca-Cola Beverage Africa located at the Capital city of Addis Ababa, Jimma Road.

#### **3.3 Research Approach**

This study used both qualitative and quantitative approaches that contributed greater to the wholeness of the investigation at hand. The quantitative approach involves the generation of data in a quantitative form which was subjected to rigorous quantitative analysis formally and rigidly. A qualitative approach to research concerned with subjective assessment of attitudes, opinions, and behavior (Kothari, 2004).

This study uses a mixed-method approach in a sequential descriptive way. Because, mixed research is useful to capture the best of both qualitative and quantitative approaches and in these the research also intended to assess the detailed trends and challenges of green supply chain management in Coca-Cola beverage Africa, Addis Ababa Plant. The advantage of using mixed methods is that this form of inquiry is that the combination of qualitative and qualitative approach provides a more complete understanding of the research problem than using only either one and also it enables to triangulate and support the data and results collected by questionnaire (Greener, 2008 and Saunders et.al, 2007).

#### **3.4 Research Design**

In this study, a Descriptive design is used because this study tried to obtain information concerning the practices and challenges of Coca-Cola Beverage Africa, Addis Ababa plant GSCM implementation in its business. The Advantage of using this research design is that it can observe the phenomena in a completely natural and unchanged natural environment and

will have the opportunity to integrate the qualitative and quantitative methods of data collection (Dudovskiy, 2018).

### **3.5 Population and Sample Technique**

The sample frame of this study was company's employees mainly of the Procurement team, Manufacturing (Within the manufacturing Specifically SHEQ team), and Logistics department team and their respective managers within in Addis Ababa plant since they have more attachment with the company, and it is expected that they are the main actors with all the knowledge and experience on the company's trends and the main Challenges of green supply Chain Practice. Then, the study population were a total of 54 respondents. Those are, 11 members of the procurement team, 30 members of SHEQ, and 10 members of the logistics team (Fleet, CDE, and warehouse) and their respective managers of those three departments.

Since the study tried to gather data from a small number of populations, a census survey was used. In this study, there was no sampling technique to select because all the members of the population surveyed and became a sample. The Advantage of a census is that with more accurate data obtained as each available member is surveyed there will be a negligible error.

### **3.6 Data Source and Data type**

In this study, there was two types of data which are primary and secondary.

#### **3.6.1 Primary data and their sources**

The sources of the primary data was gathered via semi-structured interviews and questioners for employees of the selected Departments.

#### **Methods of primary data collection**

The primary data was collected by using the following methods

**Interviews;** the interview was conducted with the procurement, SHEQ, and logistics managers of the company. It is expected that they are the main actors with all the knowledge and experience on the company's practice and main challenges to green the supply Chain management

**Structured questionnaires;** Structured questionnaires was used to get primary data from the CCBA's procurement, manufacturing, and logistics staff. The closed questions was answered using a five-point scale (Where; 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5= strongly agree). The internal environmental management, green purchasing, cooperation with customers, eco-design, investment recovery, scales were developed and assessed by Zhu

et al. (2008a), the green information systems scale was developed from items identified by Esty and Winston (2006), the packaging transportation and storage scale was developed by Mitra.S and Datta, 2014 and for the reverse logistics, scale items identified by Yihune K., 2011 will be used. The Scales are displayed in the appendix.

### **3.6.2 Methods of Secondary data and their sources:**

The secondary data was used for supporting the study and to get the findings of other researchers in the area (empirical study). Relevant Information was also gathered from different secondary sources like library books, newspapers on business, and magazines on business, different communication materials, internet sources, and other written documents and from related research materials.

### **3.7 Sample Frame**

The Sample Frame of this Study was three internal departments of CCBA those are procurement department, the manufacturing (Specifically SHEQ) department, and the logistics department because according to this study scope these are the main departments the study focuses on.

### **3.8 Sample Unite**

According to Kothari, 2004 the researcher has to decide one or more sampling that he has to select for this study. The sampling unit of this study was managers and staff who are working in procurement department, manufacturing department, and logistics department.

### **3.9 Data Analysis**

Data obtained from questionnaires was analyzed as a first raw data and tallied and tabulated. To analyze the data obtained through questionnaire a descriptive statistics frequency supported by SPSS software version 23 was applied. According to Loeb et al. (2017), a descriptive study is used not for descriptive purposes but also for determining the relationship between variables at the point of the investigation, in causal research, descriptive analysis can create or contribute to the rationale for understanding a study. Hence, in this study, descriptive statistics was used to summarize and describe quantitative information in meaningful ways. In this regard frequency distribution, percentage, cumulative percentage, measures of central tendency (mean), mode, and measures of variability (standard deviation) was employed.

The interview obtained from responses was analyzed by qualitative method. Depending on the results of the analysis, interpretations and necessary discussions was made to clarify the

issue. In the end, major findings of the study were reported and a recommendation was forwarded.

Also, the statistical analysis was used to quantify the data and apply statistical analysis to generalize findings from samples to the population of interest, and strategies of inquiry such as surveys was implemented (quantitative) regarding the research strategy and because of the closed and structured type of questions, quantitative research is better suited for theory testing.

#### 4 Reliability and Validity Tests

Indicates the extent to which a variable or a set of variables is consistent in what it is intended to measure. Reliability analysis is used to measure the consistency of items of a questionnaire. There are different methods of reliability tests, for this study Cronbach's alpha was considered to be suitable. Cronbach's alpha is also the most common measure of reliability. Thus, to test their liability of the instrument, Cronbach alpha relating to all dimensions was computed. It is recommended that the value of Cronbach's alpha exceed 0.7. Therefore, Cronbach 's alpha was test degree of consistency and the result .808 total Cronbach 's alpha values showed that meet the acceptable value. To strengthen the validity of the research, utmost care was made to adopt standard questionnaire.

**Table 3.1**

##### Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.808	.823	24

Source SPSS output, 2021

#### 4.1. Ethical Consideration

According to Belmont Report (1974) the three basic ethical principles relevant to research involving human subjects, respect for persons, Beneficence, and Justice (Shore, 2006). Accordingly, in this research, all ethical and legal issues will adhere to and will be handled professionally. Things such as confidentiality, respect of the respondent's right to participate, or quiet the research at any point will be protected. Considering this the respondents who answer the research questioners was called respondents and informants for interview respondents.

## **Chapter Four**

### **Data presentation, Analysis, and Interpretation**

#### **4.1 Introduction**

It is recalled that the general objective of this research is assessing the Green Supply Chain Management practices and Challenges of Coca-Cola beverage Africa, Ethiopia Addis Ababa Plant concerning the dimensions of green supply chain management. Therefore, the overall effort was to attain this objective and answer questions formulated in chapter one, along the lines of a scientifically valid research procedure.

Hence, as we can infer from the title, this chapter is all about the presentation, analysis, and interpretation of the study findings. Thus, in the following sections of the chapter both inferentially and descriptively found results of the study will be presented, examined, and interpreted using different statistical and judgmental procedures. Concerning this, quantitative results are presented and discussed with the help of measurement tools such as; percentage, means, and standard deviations so that, conclusion about the situation is drawn. Whereas, descriptive statistical tools such as; narrative analysis and tables have also been employed to summarize or brief and understand the qualitatively found data. To address the above-mentioned objective of the study, data collection instruments such as questionnaires and interviews were deployed. Therefore, in the following sections of the study, the accuracy of the overall research procedure, as well as the findings of the study, have been examined and presented.

#### **4.2 Reliability Test**

The study was conducted through the instrumentalism of different data gathering tools (i.e., questionnaire and interview). Questionnaires were distributed to The Procurement team, to SHEQ team, and the logistics teams in person. From the total of 51 questionnaires distributed to the designated respondents, only 46 were collected. From the remaining 5 questionnaires; 5 of the respondents were not on the job due to personal and other kinds of leaves. Therefore, the overall response rate was 90.19%.

Moreover, to evaluate the internal consistency of the item used in the data collection tool, Cronbach's Alpha is used. According to George and Mallery (2003), Cronbach's Alpha is an indicator of the degree of internal consistency of scales. The higher the coefficient the higher degree of consistency denotes; >0.9-Excellent, >0.8-Good, >0.7-Acceptable, >0.6-

Questionable, >0.5-Poor, <0.5-Unacceptable. Therefore, as shown in the table below, the result of the reliability test from all four dimensions of study three of the dimensions revealed that the items in the questionnaire exhibited Cronbach alpha rate more than enough to be called consistent or acceptable and one dimension of the study fall in a Cronbach alpha rate below 0.7 which is questionable.

**Table 4.1 Reliability of Questioners Dimension**

Dimensions	Cronbach-Alpha	No. of Items
Green Procurements	0.769	5
Green Manufacturing	0.753	7
Green Distribution and Reverse Logistics	0.810	7
Challenges in Implementing GSCM	0.697	5

Source: - SPSS output, 2021

### 4.3 Demographic Information of Respondents

A total of 51 questionnaires were distributed and 46 appropriately filled questionnaires were collected. Therefore, the overall response rate is 90.19%. The collected data were analyzed with the statistical package for social science (SPSS version 23). The following table presents frequency statistics of demographic variables.

As we can infer from the below-embedded table 23.9% of respondents were female while the remaining 76.1% of the study participants were male. Regarding educational qualification 6.52% of the respondents were college diplomas, 69.5% of the participants were BA or BSc degree holders and 23.91% were MA or MSc degree holders. With service years in the company, 19.6% of respondents served the company from 1 to 3 years, 21.7% 3 to 5 years, 50% 5 to 10 years, and 8.7% of the participant served for 10 and above years. Concerning the Age group of the respondent, 13% were in the age group of 18-25 years, 71.7% were in 26-35, 10.8% in 36-45 years, and 4.3% in 46-55 Years.

The demographic information of the respondents shows that most of the respondents are men, young under an age group of 26-35, finish undergraduate degree and serve the company 5 to 10 years.

From this we can conclude that the respondents experience in the area and educational background makes the respondents to fill the questioners with a better understanding.

**Table 4.2 Demographic Information of Respondents'**

<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>
<b>Gender</b>		
Male	35	76.1
Female	11	23.9
<b>Total</b>	<b>46</b>	<b>100</b>
<b>Educational Qualification</b>		
College Diploma	3	6.5
Undergraduate Degree	32	69.6
Master's Degree	11	23.9
Doctoral Degree	0	0
<b>Total</b>	<b>46</b>	<b>100</b>
<b>Service Year</b>		
1-3 Years	9	19.6
3-5 Years	10	21.7
5-10 Years	23	50
10 or more years	4	8.7
<b>Total</b>	<b>46</b>	<b>100</b>
<b>Age Group</b>		
18-25 Years	6	13
26-35 Years	33	71.7
36-45 Years	5	10.8
46-55 Years	2	4.3
Above 55 Years	0	0
<b>Total</b>	<b>46</b>	<b>100</b>

Source: - SPSS output, 2021

#### **4.4 Descriptive Statistics on GSCM practice and challenges from the respondent's perception**

##### **4.4.1 Green manufacturing Practice from the respondent's perception**

From the data collected, the majority of the respondents indicated that from the variables listed on green manufacturing practice the company is best in implementing EMS within the company and on monitoring waste production with a mean score of 4.17 and 4.10 respectively followed by tracking environmental information with a mean score of 3.93. Cross-functional

cooperation for environmental improvement and auditing program for EMS also showed a significant mean score of equal 3.931. In another word, the majority of the respondents believe that CCBA Ethiopia, Addis Ababa plant implement EMS, and certified with ISO 14001/2015 which was audited and renewed every year and most of the respondents believe that the company monitor waste production and from the interview question my informant clarify me on the waste treatment production and the major wastes produced from the manufacturing areas and according to my informant the major impact to the environment from the manufacturing site is that of wastes from the production areas so the company invests million dollars to build a wastewater treatment plant in 2014 which can effectively treat the major wastes which are bottle watching chemicals and lubrications, after testing and making sure that the effluent is safe for the aquatic environment it will be released to the river and after this plant has started any harm have never been happened to the society who live by the infrastructure. And relatively the respondents do not believe there is a lack management commitment in greening the supply chain and company using environmentally friendly packaging materials.

As the previous study suggested Arimura et al (2011) found that ISO 14001 promotes GSCM practices and Darnall, N., Jolley, G.J., and Handfield, R., in 2008 organizations that adopt EMSs more frequently implement GSCM practices, regardless of how long the EMS has been in place and that EMS adopters have a stronger probability of improving the environment not just within their organizational boundaries, but throughout their network of buyers and suppliers.

**Table 4.3**

<b>Descriptive Statistics</b>			
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
CCBA currently implement EMS	46	4.1739	.79734
Cross-functional cooperation for environmental improvement	46	3.9130	.66084
Mngt commitment to Greening the supply chain	46	3.8478	.72930
Monitoring Waste Production	46	4.1087	.73721
Tracking environmental Info.	46	3.9348	.67994
Using Environmentally friendly Packaging materials	46	3.8696	.80578
Auditing Program for EMS	46	3.9130	.89010
Valid N (listwise)	46		

Source: - SPSS output, 2021

#### 4.4.2 Green Procurement practice from the respondent's perception

From the data shown in table 4.5, Green procurement practice dimension cooperation with suppliers for the environmental objectives and auditing the suppliers attentively score higher mean value of 3.89 and 3.717 respectively and CCBA require suppliers to be ISO 140001 certified and purchasing items that are eco-labeled got lower mean score of 3.47 and 3.58. In other words, CCBA is good at cooperating with suppliers for environmental objectives and auditing these suppliers than that requiring supplier to implement EMS in their organization like ISO 140001 and purchasing eco-labeled products. From the Interview response my informant and company's procurement manual clearly specify that every supplier or vendor need to full fill the requirement of KORE (the Coca Cola requirement) and this KORE also include Environmental issue in it. Concerning Suppliers, every supplier needs to implement EMS within the company and every supplier needs to understand and need to work with the company for the company's environmental objectives. And my informant makes sure commitment and support of top management's commitment and support on green procurement.

**Table 4.4**

<b>Descriptive Statistics</b>			
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
CCBA cooperation with Suppliers for environmental objectives	46	3.8913	.73721
CCBA attentively Audit the Suppliers	46	3.7174	.77926
CCBA Require Suppliers to be ISO 140001 Certified	46	3.4783	.72232
CCBA Provide product specification to suppliers	46	3.8261	.73950
CCBA purchase items that are Eco labeled	46	3.5870	.65238
Valid N (list wise)	46		

Source: - SPSS output, 2021

#### 4.4.3 Green Distribution and reverse Logistics Practice from the responder's perception

In concern to green distribution and reverse logistics practices dimension, table 4.6 show us that environmentally friendly storage and cooperating with customer for green packaging score a higher mean value of equal 3.69 and a minimum score recorded on company's having proper and safe dispose site and safely disposing of unrecyclable wastes followed by encouraging green choice by customers. This can be interpreted as the majority of the respondent have a neutral idea of the company's having a proper and safe disposable site and the respondent's perception shows that the company is performing better in cooperating with

customers for green packaging and environmentally friendly storage. And from the interview, my informant mentioned for me there is no such thing as green logistics practice within the company but that of fuel conception, logistics optimization, and package after use collection is also their main KPI. To reduce vehicle fuel conception Addis Ababa plant is only distribute most of its products for customers located in western, central, and southern Ethiopia. The eastern area is covered by the Dire Dawa Plant and northern Ethiopia by Bahirdar Plant, this also used to optimize the logistics activity by shortening vehicle travel. And according my informant CCBA's reverse logistic can be said world class, due to the company's nature it is required to return used packaging products for reuse (more than half a million used glass bottles returned per day) and also some end of shelf-life products returned to the compound to dispose of.

**Table 4.5**

<b>Descriptive Statistics</b>			
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Encourage Green Choice by customers	46	3.5870	.85832
Disposing site (Data transformed)	46	3.4783	.96007
Product Design	46	3.6739	.94409
Environmentally friendly Storage	46	3.6957	.93973
Safely dispose of unrecyclable wastes	46	3.5652	.80697
Cooperate with Customer for green packaging	46	3.6957	.69505
Monitoring reverse flow	46	3.6739	.81797
Valid N (list wise)	46		

Source: - SPSS output, 2021

#### **4.4.4 Challenges in the implementing of GSCM in respondents work area**

And concerning Challenges on implanting GSCM in the respondent's work area dimension a composite mean score range from 3.02 scored by lack of management support to 3.58 scored by the high cost of GSCM implementation were recorded. Similarly, the standard deviations that range between 0.48 and 0.52 were registered. From all the dimensions the highest standard deviation score was registered on Green Procurement Practice by standard deviation score of 0.52, and the lowest was in the case of Green Manufacturing Practice by a mean score of 0.48. Correspondingly, from Challenges on implementing GSCM on the respondents work area the highest standard deviation score was observed on lack of information by

Standard deviation score of 1.01 and the lowest was on high cost for GSCM implantation by a score of 0.834.

In another word, table 4.4 shows us challenges on implementing green supply chain management practices the perception of the respondents and from the interview responses, CCBA relatively do not have a lack of management support followed by a lack of information on GSCM, a high-cost problem on implementing GSCM, lack of governmental support, a technological scarcity problem in Descending order or technological scarcity is the biggest challenge in implementing GSCM in CCBA Ethiopia, Addis Ababa Plant. Amha (2019) and Mignot (2017) also identified that lack of technology has the greatest impact on the implementation of green supply chain management.

**Table 4.6**

<b>Descriptive Statistics</b>			
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Lack of management Support	46	3.0217	.95427
Lack of Information	46	3.1522	1.01033
lack of Gov't Support	46	3.4348	.91049
Technology Scarcity	46	3.5870	.93276
high cost for GSCM implementation	46	3.2826	.83435
Valid N (listwise)	46		

Source: - SPSS output, 2021

#### **4.4.5 Descriptive Statistics GSCM Practice Dimensions**

Using a questionnaire, feedbacks on 4 dimensions was captured. These 3 dimensions were further to be operationalized by 24 items on a five-point Likert Scale, ranging from 1 to 5. Based on the responses obtained from the participants mean scores and standard deviations have been computed.

It is known that composite mean value is an indicator of the average of all respondents' views on a specific dimension. Whereas, standard deviation shows how diverse responses are the 46 participants give out on a particular dimension or its constructs. In other words, the higher the standard deviation discloses the higher the disparity of the respondent's perception about a given dimension. For that reason, the data will be widespread, which means that respondents give a variety of observations, and low standard deviation implies that respondents express close observation on a common matter.

The table below reveals descriptive data (mean and standard deviations) for the three dimensions of the study which is five green procurement sub-constructs, seven green manufacturing sub-constructs, and seven green distribution and reverse logistics sub construct incorporated in the questionnaire.

Kidane (2012), The rule of thumb on the intervals for breaking the range in measuring variables that are captured with a five-point scale (that ranges from strongly disagree to strongly agree) is 0.8, which is found by dividing the difference between the maximum and minimum scores to the maximum score. Hence, a calculated composite mean value that ranges from 1 to 1.80 implies strong disagreement, whereas the remaining ranges of 1.81 to 2.6, 2.61 to 3.4, 3.41 to 4.2, and 4.21 to 5.00 representing respondents' perceptions of disagreement, neutrality, agreement, and strong agreement respectively (as cited by Sileshi Solomon, 2016).

As presented in table 4.7, in all cases, the distribution of scores for all dimensions revealed reasonable mean and standard deviation values that show the average rate of responses on each of the 4 dimensions of the analyses. The mean value of each variable indicates that how much each variable was implemented in the company because the variable which had a great mean value has a great effect on the company's GSCM Practice.

As clearly depicted in the above table 4.3, the overall composite means a score of the GSCM practice dimensions ranges from the minimum of 3.66 mean value scored by Green Distribution and Reverse Logistics area to the maximum of 3.96 mean scores showed by Green Manufacturing practice. In other words, from the GSCM practices, dimensions listed above CCBA score relatively best performance on Green Manufacturing practice, followed by Green Procurement practice, and Green Distribution and reverse logistics.

**Table 4.7 Composite mean and Standard deviation score**

<b>Dimensions</b>	<b>No of respondents</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Green Procurement Practice</b>	46	3.7	0.52451
<b>Green Manufacturing Practice</b>	46	3.9658	0.48298
<b>Green Distribution and Reverse Logistics Practice</b>	46	3.6603	0.58788

Source: - SPSS output, 2021

To summarize, following the overall composite mean score on the aforementioned dimensions, the perception of respondents towards the current status of CCBA's green supply chain management practices the company is performing on average.

## Chapter 5

### **Summary of major findings, Conclusion, and Recommendation**

This last chapter contains three sections the first section deals with a summary of the finding, the second section is devoted to the conclusion of the study. Finally, the last section presents the recommendation that might be focused upon.

#### **5.1 Summary of Major Findings**

This research was conducted with the following purpose in mind to assess the CCBA Addis Ababa plant's green purchasing practices, To describe the CCBA Addis Ababa plant's green manufacturing practice (GMP), and to appraise the CCBA Addis Ababa plant's green distribution and reverse logistics practice and to examines the challenges concerning the implementation of green supply chain management in CCBA, Ethiopia, Addis Ababa Plant

- It was identified that a scattered perception had been shown from the respondents on top management's commitment to GSCM practices. But the interview response shows there is full support from the top management side.
- From the descriptive statistics analysis result CCBA Ethiopia, Addis Ababa Plant is doing a great job in green manufacturing practice dimension and from this dimension, the company is better performing on monitoring waste production, on EMS (ISO140001) implementation and Auditing program for this EMS.
- From the descriptive analysis, the company's green procurement practice is better described by cooperating with suppliers for environmental objectives of the company and auditing the suppliers attentively, and also the analysis shows that the company has to work on procuring eco-label products and suppliers EMS certificate as one of a requirements.
- The Descriptive analysis of green distribution and reverse logistics dimension shows that CCBA Ethiopia, Addis Ababa plant have a good practice on cooperating with customer for green packaging and environmentally friendly packaging and CCBA Ethiopia, Addis Ababa Plant have a world class revers logistics practice.
- In the descriptive analysis, it was found that technological scarcity impacts the implementation of GSCM in CCBA Ethiopia, Addis Ababa Plant. Moreover, the interview conducted also showed that the Scarcity of technology in the local market and

the governmental support in facilitating forex to access those technologies are the main challenges CCBA Ethiopia, Addis Ababa plant did face on GSCM implementation.

## **5.2 Conclusion**

The research aimed to assess the green supply chain management of CCBA Ethiopia, Addis Ababa plant. The finding of this study suggests that the company have a better practice on greening manufacturing activities and have a full support and commitment from the top management side.

According to the data analysis and the findings indicated that scarcity of technology and company lack support from the government significantly affect the implementation of GSCM. The study therefore concludes that it is a challenge for the company.

It was also identified that technological that might impede the implementation of GSCM in the manufacturing sector. It was confirmed and mentioned in the empirical literature; lack of technology has the greatest impact on the implementation of green supply chain management. Like Mignot (2017), it is possible to concluded that technological scarcity is a major challenge on the implementation of GSCM in CCBA, Ethiopia, Addis Ababa plant.

Unlike previous studies like Amha, (2019), the finding of this study show us that CCBA Ethiopia, Addis Ababa plant have full support and commitment of top managements and information about the environmental impact of the company.

The research objective and research question have been addressed and this study also contributes to the gap of the problem statement. The findings of this study contribute to the practical industry. The result of this study can be used as a guideline by various parties such as food and beverage industries, policymaker, regulation agency, and researcher to formulate their business strategies related to the implementation of GSCM.

## **5.3 Recommendation**

Based on the finding obtained and conclusions are drawn the following recommendations are proposed

- ✓ The study revealed that the current status of green supply chain management practice in CCBA, Ethiopia Addis Ababa plant is performing better in the Green manufacturing practice dimensions and much to work on green procurement and green distribution and reverse logistics practice. In this regard, different studies indicate that management and employee's commitment and vigorous support is a critical factor in the implementation of environmentally favored supply chain practice. Therefore, to safeguard the environment

from pollutants, comply with the law of the land and exploit the advantages that emanate from the very nature of green supply chain practice, the study recommended CCBA, Ethiopia, Addis Ababa plant to go further to solve the main challenges on the GSCM implementation adopt the concept of environmentally responsible supply chain management fully.

- ✓ As stated in the literature reviewed, Zhu and Sarkis (2007) mentioned in their institutional theory, Government regulation can be one of the main institutional factors that driven businesses to implement green supply chain practices. Thus, the government should support the food and beverage sector like CCBA, Ethiopia Addis Ababa plant towards implementation of green supply chain management. The Government needs to call cleaner technology manufacturers to invest in Ethiopia for that industries can get this technology locally but in the meantime, the government needs to support these industries to get those technologies in the world market by facilitating to get forex dollars and experts access.
- ✓ Since company perception of environmental impact has a significant influence on the implementation of GSCM. The company's top management should provide environmental awareness for their employee and educate them about the benefit and advantages of GSCM and provide information on the progress of the company on the effectiveness of the company's environmental objectives to its employees.

#### **5.4 Limitation and Suggestion for future studies**

- ✚ Further studies might also investigate the impact of Environmental Management System (EMS) certification such as ISO 14001 with the implementation of green supply chain management to understand whether environmental certification plays a role in improving the implementation rate of green supply chain management in CCBA, Ethiopia, Addis Ababa plant.
- ✚ One of the objectives of the study is that to fill a gap in the limitation of shreds of evidence in the GSCM practice and the main limitations in the implementation of GSCM. Further study might also investigate each dimension of GSCM (Green procurement, Green Manufacturing, and Green Distribution and reverse Logistics Practice).
- ✚ Even if in green supply chain management implementation customers and regulatory bodies play an important and effective part by exerting heavy pressure to adopt green practices in business operations this study did not take the external factors like customers and regulatory bodies into consideration.

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**Appendix**  
**Addis Ababa University**  
**College of Business and Economics**  
**School of commerce**  
**Department of Logistics and Supply chain management**

Dear Respondents, this questionnaire intends to gather information to a thesis to be conducted concerning Green Supply Chain Management practices and challenges in the case of Coca Cola Beverages Africa, Ethiopia, Addis Ababa plant in partial fulfillment of the requirements for the Master of Art in logistics and supply chain management degree and to be submitted to Addis Ababa University School of Commerce to Logistics and Supply Chain Department. Therefore, I humbly request you to consider your participation in responding to the questionnaire is of high importance to give the research a great deal of clarity about the issue. Also, I can assure you that the information to be collected from you are solely for academic purpose and will be treated with strict confidentiality. Once again, I request your valuable support in filling the questionnaire as patiently and frankly as possible.

**Background to the Study**

Green Supply chain management can be defined as integrating environmental thinking into supply chain management, including ecological design of products, purchasing green materials and components, reengineering of manufacturing steps towards being eco-friendly including energy use, water use and reverse logistics management of the product and package collection after its useful life. As such, this study tries to collect data on the implementation of Green Supply Chain Management practices and challenges in CCBA Ethiopia, Addis Ababa plant.

Keeping these in mind please give your level of agreement for the questions below.

Thank you for your time and consideration!

**Part one**

**General Information**

1. Gender	Male	<input type="checkbox"/>	Female	<input type="checkbox"/>						
2. Age	18-25 yrs.	<input type="checkbox"/>	26-35 yrs.	<input type="checkbox"/>	36-45 yrs.	<input type="checkbox"/>	46-55 yrs.	<input type="checkbox"/>	Above 55 yrs.	<input type="checkbox"/>
3. Level of Education	Secondary Education	<input type="checkbox"/>	College Diploma	<input type="checkbox"/>	Undergraduate Degree	<input type="checkbox"/>	Master's Degree	<input type="checkbox"/>	Doctoral Degree	<input type="checkbox"/>
4. How long have you been working in the company	Less than 1 yr.	<input type="checkbox"/>	1-3 yrs.	<input type="checkbox"/>	3-5 yrs.	<input type="checkbox"/>	5-10 yrs.	<input type="checkbox"/>	10 or more yrs.	<input type="checkbox"/>

**Part Two**

**Questionnaires**

Please indicate the level of GSCM Practice in your company, and use "Tick (") where you agree on a point scale (1= Strongly Disagree, 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree).

No	Green supply chain management practices	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
<b>Green Procurement Practices</b>						
1.	CCBA cooperates with suppliers for its environmental objectives. <i>Hint: - Cooperating with suppliers in transporting, storing, and collect after use rejects and packaging materials of supplied materials.</i>					
2.	CCBA attentively audits the suppliers.					
3.	CCBA requires the suppliers to be ISO 140001					

	certified.					
4.	CCBA providing product specifications to suppliers that include environmental requirements for a purchased item.					
5.	CCBA purchases products that are eco-labeled.					
<b>Green Manufacturing Practices</b>						
6.	CCBA currently implements an environmental management system. e.g. ISO 14001					
7.	CCBA has cross-functional cooperation for environmental improvement.					
8.	I am aware that the management is committed to Greening all the supply chain.					
9.	CCBA monitors waste product that is released to the environment.					
10.	CCBA tracks environmental information. (toxicity, energy used, water used, air pollution) <i>Note: - You can lower your level of the agreement if one or more of the above conditions is not fulfilled.</i>					
11.	CCBA uses environmentally friendly packaging materials. <i>Hint: - easily recyclable or decomposable.</i>					
12.	CCBA has an auditing program for its environmental management system.					
<b>Green Distribution and Reverse Logistics</b>						
13.	CCBA provides information to encourage green choices by consumers. <i>Hint: - Including the green activities of the company in its marketing.</i>					
14.	I am aware that CCBA does not have a proper and safe disposable site.					
15.	CCBA's products are designed suitably for reuse, recycle, recovery of material and/or components.					

16.	CCBA uses environmentally friendly storage.					
17.	CCBA safely disposes of unrecyclable wastes.					
18.	CCBA cooperates with customers for green packaging. <i>Hint: - Cooperating with customers to collect and reuse, recycle or dispose of used packaging materials.</i>					
19.	In CCBA systems are in place to monitor the reverse flow of materials.					

	<b>Did the barriers listed below become a challenge to Implement GSCM in your work area?</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1	High cost for GSCM implementation					
2	Technology scarcity					
3	Lack of Gov't Support					
4	Lack of information					
5	Lack of management Support					
6	If any other, _____					

## **Part Three**

### **Interview Questions**

#### **Procurement manager**

- How do you describe the effort of the company in Procuring environmentally friendly materials and chemicals?
- Do you collaborate with suppliers to achieve environmental goals?
- What are the Challenges and problems CCBA facing in the implementation of Green Purchasing?
- How do you handle problems like having the choice between buying a slightly more expensive but sustainable material, component, or service, or buying a less expensive but unsustainable material, component, or service?
- How do you describe the top management commitments GSCM implementation?
- Please write any additional points to be considered in this study.

#### **SHEQ Manager**

- What are the major wastes of the company in concern with the environment?
- How does the Company dispose of these wastes from your company?
- How did you develop GSCM practices? Through top-down decisions? Team decisions?
- What are the main Challenges the company facing in the implementation of Green manufacturing Practice?
- Is there any serious problem that the company creates for the people living nearby the infrastructure?
- How do you describe the effort of the company in converting or mitigating the impact of pollutants into valuable products?
- How do you describe the top management commitments GSCM implementation?
- Please write any additional points to be considered in this study.

#### **Logistics Manager**

- Is there any environmentally friendly mode of transportation?

- How do you describe the company's distribution strategy to make it eco-friendly transportation?
- The Product or package recovery option that best describes the company's recovery operation is

Refurbishing/remanufacturing/cannibalization/recycle

- Choose one of the following which one is you (your company) when it comes to your knowledge about reverse logistics and the level of implementation in your company:
  - a. Innocent - (No reverse logistics, no understanding of the benefits and need)
  - b. Understanding - (Non-existent, or poorly developed reverse logistics but learning the importance)
  - c. Competent - (Solid reverse logistics capability)
  - d. Developed - (Increasing efforts to implement newer techniques, growing focus on warranty recovery, meeting environmental legislature)
  - e. Excellent - (World-class reverse logistic, minimizing warranty cost, full environmental compliance, revenue from waste materials)
- What percentage of your total logistics costs do your Reverse logistics costs represent?
- Can you list out the benefits of a good reverse logistics process from your experience in the company?

Please write any additional points to be considered in this study.