DRIVERS OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICE: THE CASE OF SHOLA, MAMA AND ZAGOL MILK PROCESSORS

BY

ENDEGENA ABERA

A THESIS SUBMITTED TO THE ADDIS ABABA UNIVERSITY, COLLEGE OF BUSINESS AND ECONOMICS, SCHOOL OF COMMERCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ART IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

ADVISOR: Dr. KIRUBEL BIRUCK

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_____	_____	_____
Advisor	**Signature**	**Date**
_____	_____	_____
Internal examiner	**Signature**	**Date**
_____	_____	_____
External examiner	**Signature**	**Date**

DECLARATION

I, the undersigned, declare that this thesis entitled: DRIVERS OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICE: THE CASE OF SHOLA, MAMA AND ZAGOL MILK PROCESSORS is my original work. I have carried out the study with the guidance and support of the research advisor, Dr. Kirubel Biruck. Any other research or academic sources used here in this study have not been submitted for the award of any degree or diploma program in this or any other institution. All sources of materials used have been acknowledged.

Declared by:

Researcher Name: Endegena Abera

Signature: _____Date: _____

Addis Ababa, Ethiopia

CERTIFICATION

This is to certify that Endegena Abera has carried out his research work on the topic entitled, DRIVERS OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICE: THE CASE OF SHOLA, MAMA AND ZAGOL MILK PROCESSORS. The work is original in nature and is suitable for submission for the award of the degree of Master of Arts in Logistics & Supply Chain Management.

Advisor Name: Dr. Kirubel Biruck

Signature_____ Date:_____

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The Researcher

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Acronym and Abbreviation

GSCM–Green Supply Chain Management

GSC- Green Supply Chain

SCM- Supply Chain Management

ICT- Information Communication Technology

CS- Collaboration with suppliers

Env't-Environment

Abstract

This study focuses to assess the drivers of green supply chain management practices in the dairy sector, top three processors in Ethiopia. The primary focus of the study is to evaluate the four key factors influencing green supply chain management (GSCM) practices: government incentives, supplier collaboration, performance assessment with rewards, and sustainable SCM strategy. Both qualitative and quantitative techniques were utilized to address this issue. Data collection mechanism involved were the use of a structured standard questionnaire, Interviews. Given the small population size, the entire top management, middle management, and technical experts of the companies were included in the study to ensure accuracy. The collected data was analyzed by SPSS 23. The preliminary data is tested for its reliability by using Cronbach alpha value which is 0.83. After proceeding to detail analysis, dairy industries habited a moderate practice to green supply chain management. Among the drivers to practice GSCM are Collaboration with suppliers and government incentive dominated the responses. On the other hand significantly performance and evaluation with reward as well as sustainable supply chain management strategy are boosted to green supply chain management practice. From these drivers collaborating with suppliers and government incentives are primarily dominated. Descriptive statics, explanatory study, regression and correlation are tested for dependent and independent variables.

Key Words: Green Supply Chain Management, Drivers

CHAPTER ONE

1 INTRODUCTION

This chapter discusses the study's history, problem statement, research aims, scope of the study, and study limitations, as well as the study's importance and organization.

1.1 Back ground of the Study

Green supply chain management (GSCM) practices refer to the adoption of environmentally friendly principles and strategies throughout the supply chain to minimize its environmental impact and promote sustainability. It involves integrating ecological considerations into the design, sourcing and supplier collaboration, transport and packaging optimization, warehouse and reverse logistics management, Carbon foot print measurement and reduction, Energy efficiency and many more aspects. (Kausara, et.al, 2017)

According to (Chitramani Palanisamy et.al, 2013) definition of GSCM is: "the integration of environmental thinking in managing the supply chain, including product design, source and material selection, manufacturing processes, final product delivery to consumers and management of the product at the end of its life".

Green supply chain management (GSCM) refers to ways in which innovations and policies in supply chain management respond to the need for a more sustainable environment. GSCM aims to find ways to ameliorate negative impacts on the environment and, at the same time, to save costs, improve efficiency, increase profits, and generate consumer awareness. (Howard Frederick, et.al, 2013)

Since supply chain is the process of transferring and facilitation of materials from the production site to the end users, the concept of green logistics addresses the environmental challenges associated with traditional logistics practices, which often contribute to pollution, energy consumption, greenhouse gas emissions, and resource depletion. By adopting sustainable approaches, green logistics seeks to mitigate these negative impacts and promote more sustainable and responsible approach to logistics operations.

Implementing green supply chain management practices offers numerous benefits, including cost savings through resource efficiency, enhanced brand reputation, reduced environmental risks,

improved compliance with regulations, and increased customer satisfaction. It also contributes to the transition towards a more sustainable and circular economy. (Kausara, et.al, 2017)

Green manufacturing should be addressed in the dairy sector, as well as an economically motivated, system-wide, and integrated strategy to reducing and removing all waste streams related with the design, manufacture, use, and clearance of goods and materials as per (Thakar, 2018) Due to its low cost, high flexibility, and quicker response time, dairy companies continue to rely heavily on road transportation among all modes of transportation, despite all the advancements in air, sea, and rail transportation. This results in the dominance of road sector CO2 emissions. Thus, it makes sense that "greening" road transportation would rise to the top of the list of required duties. (Khodakaram Salimifard, et.al, 2012). Finding suppliers and acquiring raw materials adhere to predetermined ethical guidelines and certain acceptable environmental requirement is critical issue. Green procurement is a purposeful and mindful endeavor that tackles the idea of environmental sustainability in a charitable fashion. (EKIRAPA, 2022).Facilitated reverse management and disposal mechanism is not advancing in most Ethiopian manufacturing factories.

Ethiopia is the pioneer in livestock asset from Africa. Through years Ethiopia developed dairy food processing industry, which is started seventy years back from now. Dairy processing was primarily introduced in Ethiopia by Emperor Haile Sillassie in collaboration with foreign donor funds in 1940's. Shola milk was the first government owned milk processing unit established in 1947 with the capacity of ten thousand litters of milk per day. In 2008 the government opened a tender to privatize Shola milk, as a result MEDROC investment group owned the factory for sixty million birr and currently its output capacity is boosted to ninety litters of milk per day. The actors in the supply chain of this milk processing industry are Small holder farmers (SHF), Cooperatives, Distributer Agents, Retailers and the end users. The Raw milk is collected from six collection centers: Holleta, Sendafa, Debreberhan, selale, muketuri and chancho.

Sebeta Agro Industry (MAMA) is also the second dairy processing firm that has big market share in Addis Ababa followed by Shola milk and which is established in 1995 as a sole proprietorship business around sebeta. The output capacity of Mama processing factory is around fifty thousand litters of milk per day. The same supply chain process is applied as Shola milk does.

The third dairy firm I will include in the research is newly formed processor named Zagol milk, which is operated for eight years in the market and different from the above two by sourcing its milk supply from two ways. The first one is Zagol has own farm with over 200 cows, from the farm the company sourcing 25 percent of its daily milk consumption. Secondly they are collecting raw milk from SHF like Shola and Mama. Through the above supply chain process Environmental aspects will be affected from actors and it needs deep investigation how green supply chain practice is applying to the chain.

Overall, GSCM aims to strike a balance between economic efficiency and environmental sustainability in logistics operations. By adopting sustainable practices, organizations can reduce costs, enhance their brand reputation, comply with regulations, and contribute to a healthier and more sustainable planet.

1.2 Statement of the problem

Developing countries have generally focused on economic expansion rather than environmental growth. They pay less attention and spend less money on environmental issues, but their problems are worse than in developed countries. Most GSCM techniques address issues such as water contamination and pollution. Many countries have implemented some environmental regulations to limit air and water pollution, as well as garbage disposal. (Haris et al, 2018)

Environmental issues are quickly gaining traction in various industries throughout the world. They are a more serious problem in poor countries because of the predominance of old habits and the usage of obsolete technologies. Over the last two decades, there has been a growing worry about the impact of humanity's ecological footprint on the earth. The dairy sector has been identified as a significant contribution to Ethiopia's overall greenhouse gas emissions. It is one of the sectors of the economy that have been identified as significantly contributing to global carbon emissions. (EKIRAPA, 2022)

For sustainable and comfortable future the green integration of suppliers, producers, as well as distributors and users of processed good should be aware and give attention to the concept of green supply chain management. (Kausara, et.al, 2017)

Dairy industry in Ethiopia is too small compared to the country excess livestock with respect to high demand size for milk consumption in the country. Due to this companies are focusing on mass production, most of them are not working for the green effect and environmental protection. (Fekdu, Decemer, 2023)

The routine steps of processing milk from the initial to final market stage are highly concerned with the environmental damage and contamination. In spite of the modern and technology wise processing; Whey (bi-product), Solid waste, dung and slurry from dairy cows, energy and water consumption are major environmental issues in the dairy and milk processing sector. The different stages in the production of milk are: A).Upstream: This is raw material sourcing and collection of raw milk from small holder farmers and cooperatives from selected collection points to the production plant. B).Manufacturing (Production development stage): this is an operational stage that the milk gets pasteurized and packaged to the market. C). Down Stream: The stage of carrying outputs the end users through distributors and retailers.

As per the preliminary survey conducted by the researcher it revealed that environmental friendly materials are not available in the market ecosystem and no one knows how to implement GSCM. Moreover, there are no set of rules set by the government for the implementation of green supply chain management practice. The supply chain management department managers also exposed that there is the knowledge gap and conceptually GSCM is not well addressed in the sector.

The country's earlier research either used a case study methodology or concentrated on a particular fact of GSCM procedures, which limited the applicability of the findings. This study looks at four GSCM drivers how they improve the practice for the environmental concerns, increasing the generalizability of the results. Ethiopia's dairy supply system is chosen for this study because it is important to Ethiopia's economy and makes a substantial contribution in relation to GDP. Furthermore, agriculture is among the industries that are directly impacted by climate change, which has serious and severe effects on people's quality of life.

1.3 General Objective of the study

The overall goal of this study is to evaluate the drivers of green supply chain management practice in the case of Shola, Mama, and Zagol milk processors.

1.4 Specific Objective of the study

1. To what extent *government incentive* enables green supply chain management practice, the case of Shola, Mama and Zagol milk processors.
2. To examine the effect of *collaboration with supplier* on green supply chain management practices, the case of Shola, Mama and Zagol milk processors.
3. To assess the level of *performance and evaluation with reward* in the green supply chain management practice, the case of Shola, Mama and Zagol milk processors.
4. To examine the effect of *Sustainable supply chain management strategy* on green supply chain management practice: the case of Shola, Mama and Zagol milk processors.
5. To see GSCM Practice engagement and its flow: the case of Shola, Mama and Zagol milk processors.

1.5 Research Questions

1. What is the role of *Government Incentive* in the green supply chain management practice: the case of Shola, Mama and Zagol milk processors?
2. How *Collaboration with suppliers* affect green supply chain management practice, the case of Shola, Mama and Zagol milk processors?
3. How *performance and evaluation with reward* affect the green supply chain management practice, the case of Shola, Mama and Zagol milk processors.
4. What is the effect of *Sustainable supply chain management strategy* on green supply chain management practice: the case of Shola, Mama and Zagol milk processors?
5. What look GSCM Practice engagement and its flow: the case of Shola, Mama and Zagol milk processors?

1.6 Scope of the study

This study assesses the green supply chain management practice in the Ethiopian dairy processor industry; shola, mama and zagol milk processors. It is in Addis Ababa and within thirty kilometer radius from Addis Ababa. In the study own dairy farming milk processors and those who collecting raw milk from SHF are included. Both qualitative and quantitative (Mixed) research approach applied.

1.7 Limitation of the study

Literature gap in the green supply chain management practice is the main challenge, especially in the Ethiopian dairy sector context there are no adequate documents.

1.8 Significance of the study

This research allows the organization to understand the gaps connected with present GSCM procedures and drivers in order to take remedial action based on the study's findings. The study assesses the drivers of firms' GSCM processes, providing insight into how Green supply chain management is managed, allowing the organization to work on issue areas.

The project will also promote awareness about the benefits of efficient green supply chain management in environmental response efforts aimed at climate change mitigation. The study also allows the reader to learn about the four drivers of green supply chain practices, which include government incentives, collaboration with suppliers, performance and assessment with

reward, and a sustainable SCM strategy. Furthermore, this study can act as a stepping stone for future scholars interested in the issue.

1.10 Definition of Terms

GSCM: practices refer to the adoption of environmentally friendly principles and strategies throughout the supply chain to minimize its environmental impact and promote sustainability. (Kausara, et.al, 2017)

Whey: Whey is found in the watery portion of milk. When cheese is produced, the fatty parts of the milk coagulate and the whey is separated from it as a by- product. (Allen, 2022)

1.11 Organization of the paper

This proposal is organized from five parts. The first section provides a brief overview of the subject area, as well as research questions, significance, scope, and essential term definitions. The second one includes a survey of both theoretical and empirical literature on the issue produced by various writers, as well as the study's conceptual framework. Third part, present the research methods and methodology used to conduct the study. It also goes into detail about the research concept and approach, data sources, study population, data gathering methods, and analytic techniques. The fourth chapter discusses data analysis and variable interpretation using statistical methods, specifically SPSS 23 software.

Chapter five contains the conclusion and recommendation part. Reference and the proposed questioner is also attached in the final pages.

CHAPTER TWO

2 LITRATURE REVIEW

This chapter recaps related literatures on green supply chain management practices (green purchasing/ procurement, green transportation, green manufacturing, and reverse logistics) and their drivers (government incentives, collaboration with suppliers, performance and evaluation with reward, and sustainable SCM strategy) from both theoretical and empirical point of view.

2.1 Theoretical literature

2.1.1 Supply chain Management

The definition of "supply chain" appears to be more common among authors than the definition of "supply chain management". A supply chain is a network of businesses that move commodities forward. A supply chain typically includes numerous independent enterprises participating in the manufacturing and distribution of a product to the end user, including raw material and component producers, product assemblers, wholesalers, retailer merchants, and transportation companies. A supply chain is defined as the alignment of businesses that bring products or services to market. It's worth noting that these supply chain principles involve the final consumer. (John T. Mentzer, 2001)

The definition of "supply chain" appears to be more widespread among authors than the definition of "supply chain management" (Cooper and Ellram 1993; La Londe and Masters 1994; Lambert, Stock and Ellram 1998). According to La Londe and Masters, a supply chain is a collection of enterprises that move materials forward. A supply chain often includes raw material and component makers, product assemblers, wholesalers, retailer merchants, and transportation organizations who work together to manufacture a product and deliver it to the end consumer. (La Londe and Masters 1994). By the same token, Lambert, Stock, and Ellram define a supply chain as the alignment of firms that brings products or services to market. Note that these concepts of supply chain include the final consumer as part of the supply chain. (John T. Mentzer, 2001)

A supply chain, according to another definition, is a network of businesses involved in the various processes and activities that produce value in the form of products and services given to the end consumer via upstream and downstream links (Christopher 1992). In other words, a supply chain is made up of numerous enterprises, both upstream (supply) and downstream distribution), as well as the end consumer. (John T. Mentzer, 2001).

Given these criteria, a supply chain is described in this paper as a collection of three or more entities (organizations or persons) directly participating in the upstream and downstream flows of products, services, funds, and/or information from a source to a customer.

2.1.2 Green Supply Chain Management

According to (Chitramani Palanisamy et.al, 2013) definition of GSCM is: "the integration of environmental thinking in managing the supply chain, including product design, source and material selection, manufacturing processes, final product delivery to consumers and management of the product at the end of its life".

According to Patrick Penfield of the Whiteman School of Management, sustainability is "the process of using environmentally friendly inputs and transforming these inputs into outputs that can be reclaimed and re-used at the end of their lifecycle, thus creating a sustainable supply chain." The definitions and explanations provided by many researchers on this topic lead to a shared platform with various groups of practices in GSCM. Green supply chain management (GSCM) refers to supply chain innovations and policies that address the demand for a more sustainable environment. GSCM attempts to develop solutions to alleviate negative impacts on the environment while also saving costs, improving efficiency, and increasing profitability.
. (Howard Frederick, et.al, 2013)

2.2 Empirical Review

2.1.2.1 Green Procurement

There are various terms used to describe green procurement, including ethical sourcing and ethical procurement. This is a relatively new idea that has lately been a major topic of worry because of the rising environmental pollution levels that are directly related to the operations of businesses. It is the initial stage of locating the raw resources needed for manufacture.

Finding suppliers and acquiring raw materials are two of its primary tasks that adhere to predetermined ethical guidelines and certain acceptable environmental requirements. Green procurement is a purposeful and mindful endeavor that tackles the idea of environmental sustainability in a charitable fashion. (EKIRAPA, 2022)

2.1.2.2 Green transport

(Khodakaram Salimifard, et.al, 2012) "Green Transportation" as: "Transportation service that has a lesser or reduced negative impact on human health and the natural environment when compared with competing transportation services that serve the same purpose".

The automobile sector is critical to the world's main economies and affects all levels of society. The automotive industry's strength is its internal combustion (IC) engine, which runs on fossil fuels. The current transportation structure is primarily reliant on IC engine-based transportation, but toxic emissions of carbon dioxide (CO2), carbon monoxide (CO), nitrogen oxides (NO2), and unburned hydrocarbons (HCs) in huge quantities have resulted in environmental pollution and global warming. The exponential development in population and personal transportation interests has increased the number of automobiles around the world.
It has caused and continues to cause severe environmental problems and hazard to human life. (Aishwarya Panday, et.al, 2014)

Despite developments in air, sea, and rail transportation, firms continue to rely significantly on road transportation for its low cost, great flexibility, and faster reaction time. This leads to the road sector's dominance in CO2 emissions, with road freight accounting for 30% to 40% of total CO2 emissions. As a result, it makes reasonable that "greening" road transportation would ascend to the top of the list of necessary activities.. (Khodakaram Salimifard, et.al, 2012)

The transportation sector is the irreplaceable infrastructure that enables economic and social progress. The sector transports millions of tons of freight and a large number of passengers every day. People commute to work, freight is moved to and from plants, pupils are transported to school, families go grocery shopping, and many other activities are depending on the sector. However, despite its importance to world existence, it poses a threat because it is one of the largest consumers of petroleum products and hence a major contributor to the existing dangerous particles in the air, with greenhouse gasses and CO2 being the most prevalent of them.

(Aishwarya Panday, et.al, 2014) Concludes that Various fuel-efficient technologies, such as hybrid automobiles, are fundamentally the solution to meeting the world's desire for a greener environment. This article tackles a variety of topics, including pollution sources, the decline of fossil fuels, reliance on oil energy, and the necessity for environmentally friendly automobiles. It recommends the use of hybrid vehicles, discusses the obstacles of incorporating them into the transportation system, and offers solutions. The current situation of hybrid vehicles on the road around the world, as well as initiatives launched by various governments, are covered briefly. The report discusses governments' plans to focus on securing their energy resources, reducing dependency on fossil fuels, and promoting hybrid automobiles on highways in a pollution-free society.

Greenhouse gases (GHGs) trap heat, increasing the earth's temperature. According to Singh et al. (2008), the number of automobiles surged ninefold between 1980 and 2000, while gasoline/diesel usage for road transportation quadrupled. CO2 emissions, as well as other gases such as CO and NOx, are the primary sources of GHGs. According to the Financial Express (2010) study, India's GHG emissions increased by 4.2% in 2000, totaling 1301.21 million tons, compared to 1994. According to a report by the Ministry of Environment and Forests, state net GHG emissions in India were 1727.71 million tons of CO2 equivalent in 2007.
. (Aishwarya Panday, et.al, 2014)

The transportation sector is the irreplaceable infrastructure that enables economic and social progress. The sector transports millions of tons of freight and a large number of passengers every

day. People commute to work, freight is moved to and from plants, pupils are transported to school, families go grocery shopping, and many other activities are depending on the sector. However, despite its relevance to world existence, it is a threat to it because it is one of the largest consumers of petroleum products and thus a key creator of the existing dangerous particles, including greenhouse gases and CO2, as the most prominent of them, in the air.
. (Khodakaram Salimifard, et.al, 2012)

2.1.2.3 Green Manufacturing

The concept of green manufacturing is relatively recent, having emerged in the 1980s. Waste reduction in production became the primary focus of sustainable manufacturing efforts starting in the 1980s. Following this, the paradigm for sustainable manufacturing shifted from being process-oriented to being product-oriented, with a primary focus on the creation and use of renewable materials as well as the reduction of energy, resources, and toxic compounds (Seliger et al., 2008). Environmental protection laws, rules, and tax implications are already in effect in many countries. The global industry has been compelled to adopt greener practices due to a combination of economic, technological, and environmental factors, as well as environmental restrictions.

Indian Companies are feeling the pressure to go green, as many of their Western counterparts are building environmental sustainability into their business practices. For Indian companies, there are other compelling reasons to develop GM practices. Here is a list of the top GM practicing companies in India according to Verdurous India Index. (Thakar, 2018) However, empirical research on environmental manufacturing practices and competitive outcomes reflects some methodof logical limitations, which may be partially responsible for the historically inconclusive results. Measures of outcomes are sometimes expressed as financial measures (profits, sales, revenues) that are far-removed from more direct manufacturing competitiveness outcomes such as cost (and are affected by many more variables.

Green manufacturing has been defined as an economically driven, system-wide and integrated approach to the reduction and elimination of all waste streams associated with the design, manufacture, use and disposal of products and materials. (Thakar, 2018)

2.1.2.4 Reverse Logistics and disposal

Reverse logistics encompasses tasks like fixing, using safe and recyclable packaging, recycling, reusing, and using eco-friendly wrapping materials. In the conventional product flow process, products are delivered to the store by the producer, and then to the final consumers. Inverse logistics however, starts with the end user and proceeds in the opposite way in the chain of supply. It frequently entails obtaining and supplying completed goods that have been previously provided to the final clients. These products might be defective or returnable goods. When implemented properly, reverse logistics may guarantee that businesses minimize operational expenses, enhanced brand loyalty and image, and a larger market share. (EKIRAPA, 2022)

Industrial mutuality is a crucial idea that reverses logistics has also contributed to. Here, a number of firms band together to help one another lower operating expenses by using one another's industrial wastes as manufacturing inputs procedures. This helps to reduce operating expenses because money that was previously set aside for Purchases of raw materials could be directed into other, more worthy areas of business. Additionally, it guarantees that industrial wastes that would have otherwise ended up in landfills have a ready market as worthless content. (EKIRAPA, 2022)

2.4 Drivers of Green supply chain management practice

1) Government incentives

Surveys shows that consumer attitudes to Electric Vehicles in Manitoba, Canada from late 2011 to early 2012 and revealed that consumers are unwilling to pay substantial premiums for EVs. Investigations of the Chinese Electric Vehicle Subsidy Scheme (EVSS) show that financial incentives are essential if EVs are to be cost-competitive with conventional internal combustion vehicles (ICVs) (Han Hao et. al, 2014).

Likewise incentives from the government can affect the Extent of green supply chain Management implementation Execution as well as and practice.

H1: Government incentives promote green supply chain management practice deployment.

2) Collaboration with input Providers (suppliers)

Being environmentally conscious entails employing cutting-edge technology. In many industries, innovation is often generated cooperatively by a network of enterprises, particularly medium-sized firms. The purchasing function has a significant impact on the firm's innovative success because it evaluates and ultimately selects suppliers. Suppliers can help firms innovate by conducting their own R&D and absorbing part of the R&D expenditures that the buying firm would otherwise bear.

Suppliers may have useful information of production and fulfillment procedures that might affect business performance. Finally, suppliers can share ideas for better products and features, allowing the buying firm to improve its own products. We define innovation success as the level of product and process advancements along with lower R&D costs when compared to other supplier relationships.

(Daniel Corsten et al, 2004)

H2: Collaboration with suppliers improves green supply chain management practice enactment.

3) Performance and reinforcement or reward system within organization

Rewards have been known to have a positive effect on employee performance in an organization. However no reward system that is good enough, this is because motivation is something personal and also what motivates one employee could be different from another. There are different suggestions that can be given to services in an organization. Job satisfactions are at average shows those employees are not satisfied with their job that is why they don't perform great which result to customer dissatisfaction. Lack of training and over burden of work also contributes to employee dissatisfaction. Employees are not satisfied with their salary package and other inventive which lead to poor performance in an organization. (Felix Francis et al, 2020)

H3: Employee performance and reward systems have a positive impact on green supply chain management practices.

4). *Practice of sustainable supply chain management strategies*

In the process of green supply chain management, businesses consider environmental challenges in their interactions with suppliers and customers. The product's production process consumes energy, resulting in the emission of carbon dioxide gas into the environment. As a result, green supply chain management requires production to be clean and environmentally friendly. Additionally, environmental sensitivity is necessary in purchasing actions. Within this context, businesses should not endanger human health with the commodities they purchase or degrade the environment. However, the supplier from whom the goods are obtained should also consider environmental factors. (Cui Haiyun et al, 2021).

Such strategies set by the companies' enable to perform their GSCM activities in the better way.

H4: Implementing green supply chain practices is favorably correlated with the presence of supply chain management Strategy.

Factors affecting green supply chain management practice

- **Lack of top management support**

The phrase "top management" refers to the executives at the very top of an organization who work together to make important decisions and improve the bottom line of a business. This group includes executives with titles such as chief executive officer (CEO), director, partner, president, and manager. The goal of TMS is to provide all company employees with the tools and direction they require to realize. (Feng Men, et.al, 2023)

- ***Lack of customer's collaboration***:

Resistance to new system is a big challenge in change management. Likewise when GSCM is introduced customers repel and they do not collaborate easily. But practice pointed out how customer satisfaction resulting from GSCM practices may enhance loyalty feelings towards an organization, which in turn gets translated into an increase in market share as seen in many cases. (Rameshwar Dubey ,et.al, 2015)

- ***Lack of cross-departmental communication***

Cross-departmental Over the last three decades, one of the most significant administrative changes has been the promotion of communication and collaboration to address cross-jurisdictional administration difficulties. Almost all prior empirical research have studied the direct impact of cross-departmental collaboration on organizational performance, without accounting for the indirect effects of managerial practices.. (Warit Wipulanusat et.al, 2021).

In the same scenario communication among departments in the factory can impact GSCM.

- ***Lack of awareness regarding environmental issues.***

With increased knowledge of environmental challenges, there is a greater need for environmentally friendly company operations. Prior research has shown that existing and potential stakeholder groups influence the implementation of environmental management practices through external pressures from legislators, environmental groups, financial institutions, and suppliers, as well as internal pressures from employees and owner/manager attitudes and knowledge. However, it has been stated that despite strong "green" sentiments among business owners/managers, the level of adoption of environmentally friendly activities is low.. (David L. Gadenne et.al, 2008)

- ***Lack of technological advancement***

The development of technological capacities in poor countries is quite limited. The majority of people in developing countries must rely solely on their labor, with minimum tools and equipment, insufficient education and training, limited access to financial institutions, and inadequate infrastructure. As a result, productivity is low, and there is widespread underemployment. This is the root cause of persistent and extreme mass poverty in developing countries. As a result, the development of productive capacities, particularly technological learning and creativity, is impeded.

. (Muhammed Miah et al, 2012)

Green supply chain is also one of the functions that highly need technology advancement.

2.4 Conceptual Framework

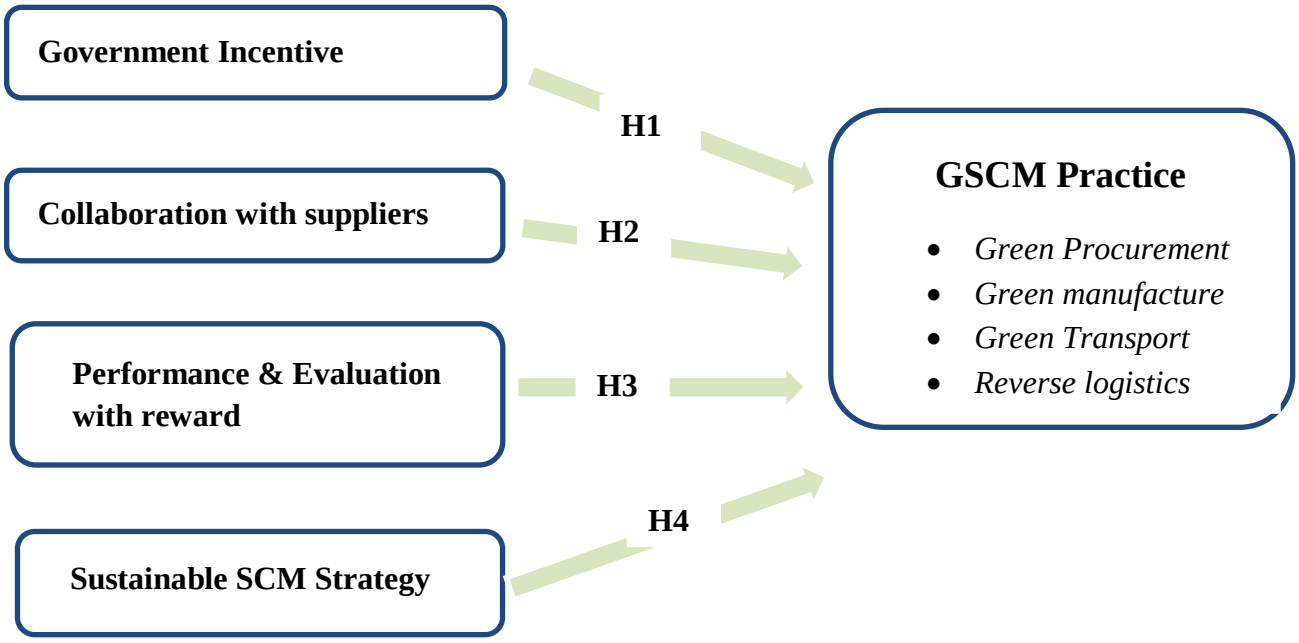

Figure 1 conceptual framework diagram

Source: Literature compilation from empirical and theoretical researches.

2.6 Literature gap

There hasn't been much research done on the drivers of green supply chain management; most materials are focused on conventional logistics and supply chain management practices. Furthermore, the literature on the relationship between supply chain management in Ethiopian food industry is not seen. Green supply chain management idea in Ethiopia is quite new and not deep. It is extremely unusual to come across literature discussing its trend in the context of the nation.

As a result, there is little literature in this sector, and this study is intended to fill the knowledge gap on environmentally friendly supply chain management approaches in general, particularly in the dairy food industry. As previously stated, the researcher is unaware of any clearly developed green supply chain management practice model for Ethiopia's dairy business. As a result, it is expected that this study will provide a solution to the problem. Furthermore, it could serve as a

springboard for the development of other relevant supply chain management practice models in the area.

2.6 Research Hypothesis

H1: Government incentives positively and significantly promote green supply chain management practice deployment.

H2: Collaboration with suppliers positively and significantly improves green supply chain management practice enactment.

H3: Employee performance and reward systems have a positively and significantly effect on green supply chain management practices.

H4: Implementing green supply chain practices is positively and significantly correlated with the presence of supply chain management Strategy.

CHAPTER THREE

3 RESEARCH METHODOLOGY

3.1 Study Area Description

Shola milk was the first government owned milk processing unit established in 1947 with the capacity of ten thousand litters of milk per day. In 2008 the government opened a tender to privatize Shola milk, as a result MEDROC investment group owned the factory for sixty million birr and currently its output capacity is boosted to ninety litters of milk per day.

Secondly, Sebeta Agro Industry (MAMA) is also the second dairy processing firm that has big market share in Addis Ababa followed by Shola milk and which is established in 1995 as a sole proprietorship business around sebeta. The output capacity of Mama processing factory is around fifty thousand litters of milk per day. Thirdly Zagol milk, which is operated for eight years in the market and different from the above two by sourcing its milk supply from two ways. The first one is Zagol has own farm with over 200 cows, from the farm the company sourcing 25 percent of its daily milk consumption. Secondly they are collecting raw milk from SHF(Small holder Farmers) like Shola and Mama.

3.2 Research Approach

To generate the research questions outlined in chapter One, a mixed research methodology was used to conduct this study, which included both qualitative and quantitative research methods. The qualitative analysis analyzes the company's experience, drivers, and strategies for implementing green supply chain management. It also aids in a clearer understanding of the drivers influencing green supply chain management practice in the Ethiopian dairy food sector, as well as the enabling environment that exists and lacks within it.

The quantitative analysis was primarily meant to analyze the statistical state of organizations in terms of their level of green supply chain management practice using the company's resources and prospective capability. Therefore mixed research is suited for this research due to the Varity nature of the study area and complex situations of drivers in the GSCM Practice.

3.3 Research Design

This study's research design is descriptive and explanatory, with statistics used to test hypotheses. These designs were chosen based on the nature of the study, which aimed to establish a green supply chain management system for Ethiopia's dairy food business. It is a company level one single time frame study. The research is setting in the field (factory)

3.4 Population and Sample Design

This time, there are about 32 dairy food processors that are serving the Addis Ababa dairy market. Of these Sebeta Agro industry (Mama Milk) and Zagol milk are indigenous processing firms followed by lamme Dairy (Shola Milk). Purposive sample was adopted in this study because the research primarily focuses on the level of enactment of green supply chain processes, for which the oldest top three pioneer processors were chosen. The purposive sampling technique was used for a variety of reasons. Aside from their proximity, it is assumed that the companies are knowledgeable with environmental protection practices because they have been in business for a long time.

To support this, it is clear that factories have a bi-product that will be thrown away and waste water treatment that can impact the environment. The case for Shola Milk shows that 7300 cubic meter bi-product (Whey) flee out to the environment. Similarly, the researcher is interested in studying the firm's green supply chain initiatives. SCM department of the companies has 40 employees from all managerial levels (top middle and expert) (17 from shola, 15 from Mama and 8 from zagol milk). The respondent variation through companies is based on the amount of employee the firms has. Because of the small number of personnel in the supply chain management department, this study used the census approach to sample the entire population. A questionnaire was issued to 40 employees who were familiar with the GSCM idea.

3.5 Data source and collection Procedure

For this study, both primary and secondary data were collected. Primary data were acquired through interviews and questionnaires. The structured interview is with the heads of each company's supply chain, procurement, and logistics (transportation) departments, as well as questionnaires for supply chain, procurement, and logistics personnel, to understand the company's current status in terms of green supply chain management using a five-point scale (1-

5 strongly agree to strongly disagree). Secondary data was acquired through surveys, key informant interviews. With this regard, the company's purchasing, transportation, and reverse logistics were revised and appraised to develop the solution.

3.6 Method of Data Analysis and Presentation

Thematic and content based review applied for the questionnaire and interview questions. The data is analyzed based on the specific objective and questions.

The data collected from respondents was analyzed and interpreted using the Statistical Package for Social Science (SPSS, version 23). Descriptive statistics were calculated independently for each variable. Then the Correlation among these variables is run to determine the strength of their link. After verifying all assumptions, multiple regressions were performed on the aggregated variables to identify drivers of green supply chain practices.

3.7 Validity and Reliability

3.7.1 Validity

Questioners were towards our objective and they are structured, this assures our validity of research. Validity was a measure to know how the researcher uses accurate instrument in acquiring the data planned to collect and reveals the extent to which the instrument measures what it was planned to measure. (Kothari, 2004)

3.7.2 Reliability Test

For the reliability measure of the respondents the researcher was used the coefficient of cronbach alpha, which is most common and here also it will be applied. So that Cronbach alpha value less than 0.6 disqualify the respondent reliability and greater than 0.7 will be acceptable (Kothari, 2004). Therefore the researcher used some sample questionnaire and analysis of the cronbatch alpha value is 0.763 which tells the internal consistency is very good as indicated below.

Construct	*Variable*	*Cronbach alpha*	*No Items tested*
Drivers of GSCM Practice	*Government Incenyive*	*0.829*	*4*
	Collaboration with suppliers	*0.881*	*6*
	Performace and evaluation with rewards	*0.813*	*4*
	Sustainable SCM Strategy	*0.755*	*4*
GSCM Practics	*Green Procurment*	*0.909*	***5***
	Green Transport	*0.89*	*3*
	Green Manufacturing	*0.783*	*3*
	Reverse Logistics	*0.819*	*3*
	Grand Mean Reliability	**0.83**	**32**

Table 1 Reliability test

Source: Own survey, SPSS output, 2024

3.8 Ethical consideration

The researcher acknowledged ethical norms such as participant confidentiality and dignity, integrity, never constructing or destroying data without an account, and plagiarism. The researcher has taken the most precautions before beginning the research and has informed the study's participants about the study's objectives, as well as deliberately considering ethical issues in seeking agreement, avoiding fraudulence, maintaining confidentiality, and respecting the privacy of all respondents. The researcher evaluated these considerations since the law of ethics on research prohibits doing study without the consent of the respondents for the reasons stated above.

CHAPTER FOUR

4 DATA ANALYSIS AND INTERPRETATION

4.1 Demographic Profile of the respondents

Questionnaires were distributed to a total of 40 respondents and by serious follow up and approach all questionnaires are filled and returned for the analysis.

A five scale likert scale questions from strongly disagree to strongly agree (1=strongly dis agree, 2=disagree, 3=neutral, 4=agree and 5= strongly agree) questions are used to get respondents insight for the research. SPSS 23 is used for the respondent's descriptive analysis.

Table 2 Demographic background of respondents

		Frequency	Percent
Age of Respondents	25-35 years	15	37.5
	36-45 Years	16	40.0
	above 46 year	9	22.5
	Total	40	100.0

		Frequency	Percent
Educational Background of respondents	Deploma and Below	1	2.5
	First Degree	18	45.0
	Masters Degree and above	21	52.5
	Total	40	100.0

		Frequency	Percent
Work experiance of Respondents	Below 2 years	5	12.5
	2-5 years	17	42.5
	6-10 Years	17	42.5
	above 11 years	1	2.5
	Total	40	100.0

Source: Own survey, SPSS output, 2024

As shown in the table the age mix of the respondents revealed most of them were below 45 years of age, which is 77.5% of the respondents. The rest 22.5% of the cases are above the 46 yr.

The literacy status of the respondents was with 45% of the respondents are degree holders and 52.5% of them have also masters and above degree. Only 2.5 % of respondents are still in diploma level.

Seventeen respondents are experienced up to 2-5 years, which is 42.5% of the total. In the same scenario 42.5% of them are also experienced for 6-10 years in the industry. 12.5% of them are experienced below two years and only 2.5% are experienced for more than 11 years.

4.3 Drivers of Green supply chain Management Practice

4.3.1 Government Incentive

Government incentive and regulations require organizations to adopt environmental practices. Recently, natural have been depleted at an ever increasing rate. In this situation government bodies have agencies have good reasons to introduce (green) regulations to protect these scarce resources. Barriers to green business have forced companies to obtain ISO 14000 certification, but increasing regulatory and community pressures have played a key role in forcing companies to balance environmental and economic outcomes by adopting strategies that minimize the negative environmental impacts of their supply chain activities (Francis, 2019)

The role of country's government for the development of Safe and sustainable environment is the lion share, the rules and regulations imposed by the government to achieve green supply chain management are critical. Not only rules but also governmental incentives enable the GSCM Practice. Government incentive and regulation scores 4 and 3.98 respectively. On the other hand subsidy policy and reducing taxes are scoring 3.9 and 4.1 respectively. (Best, 2005) mean rank is applied to rate questionnaires.

As per the data government incentive for GSCM Practice scored high and significant with a mean of 3.98.

Table 3 Government Incentives

Descriptive Statistics		
Indicators, N=40	Mean	Std. Deviation
Government incentives help companies to embrace green supply chain management.	4.00	.816
Government subsidy policies assist companies to undertake green supply chain management.	3.90	.871
Reducing tariffs on technology adoption assures economic, societal, and environmental benefits, allowing the implementation of green supply chain management at the company.	4.10	1.081
Environmental laws imposed by the government on the dairy industry enable the Company to apply green supply chain management.	3.93	1.118
Sum/Average	**3.98**	

Source: Own Survey, SPSS output, 2024

4.3.2 Collaboration with suppliers

Several studies have shown the importance of customer pressure in shifting businesses toward green practices. As society's environmental consciousness grows, customers become a significant pressure group in pressuring businesses to embrace GSCM practices. Increasing pressures from the community and customers urge businesses to include green practices into their normal operations and overall strategy.

Highly, working with the supplier enables the execution of green supply chain management with a company rating of 3.85 secondly; the commitment of the suppliers to the design requirements of the Company according to economic, social and environmental specifications enables the enactment of a green supply chain with 3. 85 and Cooperation with the end user for ecological design, green packaging enables the enactment of green supply chain management The Company also has an average of 3.85. These three points are the minimum out of the whole questions under collaboration with suppliers.

Table 4 Collaboration With suppliers

Descriptive Statistics		
Indicators, N=40	Mean	Std. Deviation
Working with suppliers for GSCM facilitates the implementation of green supply chain management in the company.	3.85	1.075
Suppliers' adherence to the Company's design requirements in terms of economic, social, and environmental friendly parameters enables the Company to apply green supply chain management practices.	3.85	1.312
Suppliers' compliance with the Company's green supply chain requirements enables the adoption of green supply chain management at the Company.	3.93	1.141
Collaboration with customers on eco-design and green packaging enables the company to implement GSCM practices.	3.85	1.099
Collaboration with customers to reduce energy consumption during product transportation enables the execution of GSCM at the company.	4.23	.974
Environmental collaboration with suppliers facilitates the adoption of GSCM at the Company.	4.05	.815
Sum/Average	**3.96**	

Source: Own Survey, SPSS output, 2024

Respondents data indicates that strong and significance effect of collaboration with supplier, encouraging customers to reduce energy consumption during product transportation allows the company to implement green supply chain management, and the same applies to environmental collaboration with suppliers allows the company to implement green supply chain management.

Our survey indicates that suppliers are playing a significant role in developing Green supply chain management environment with the mean score 3.96. Hence sourcing inputs in the dairy industry requires best supplier selection and enhancing green purchasing and transport enable the improved GSCM Practice. Hence to implement green supply chain management in the dairy sector it is a must that collaborating with sourcing unit that are suppliers. Empirically supported that, from all the variables this supplies collaboration has a big and lion shared role in the GSCM Practice and it is crucial driver to the practice

4.3.3 Performance Evaluation and rewarding system

Table 5 Performance Evaluation and Rewarding System

Descriptive Statistics		
Indicators, N=40	Mean	Std. Deviation
The organization's performance evaluation and reward system makes it possible to apply green supply chain management.	4.05	.846
Setting performance criteria in the organization allows for the implementation of GSCM management.	3.78	.862
Setting explicit goals for GSCM (economic, social, and environmental) in the firm makes it possible to adopt green supply chain management.	3.93	.944
GSCM Practice can be implemented with motivational appreciation and bonuses.	3.93	.859
Sum/Average	**3.92**	

Source: Own Survey, spss output, 2024

The alliance of environmental and social responsibility goals into organizational strategy plans necessitates a mechanism for measuring and rewarding performance that contributes to that aim. It can also be effective for communicating sustainability objectives, tracking sustainability performance, and rewarding staff for their sustainability efforts or meeting sustainability targets. The overall average for performance evaluation and awarding systems as a driver to perform of GSCM is 3.92.

The performance evaluation and incentive system in the organization facilitates the adoption of green supply chain management was extremely significant (mean = 4.13). Setting performance requirements inside the firm allows for the implementation of green supply chain management, which has a considerable effect (mean 3.78). Finally, setting particular goals connected to GSCM practices (economic, social, and environmental) in the company allows for the implementation of green supply chain management. Motivational appreciation and bonuses for the use of green supply chain management Practice boosts the implementation of green supply chain management in a substantial way (score 3.93).

According to (Felix Francis et al, 2020) Performance and reward is the indication of a high and significant relationship in the green supply chain management practice. Employee satisfaction and evaluation with reward has a huge impact to introduce new organizational change. Numbers are indicators that rewarding based on performance is not enacted as expected in the dairy sectors. But it is clear that this variable is affecting the GSCM beyond moderate level.

4.3.4 Sustainable Supply Chain management Strategy

The Sustainable Supply Chain Management (SSCM) concept has expanded to encompass the supply chain's social, environmental, and financial concerns. A systematic review was undertaken to improve SSCM performance management and establish a future research agenda. There are extensive evaluations of the literature on SSCM available; however, this study focuses on the SSCM strategy. The SSCM Strategy has a favorable impact on GSCM Practice. (Abbas, 2023)

Table 6 Sustainable Supply Chain Management Strategy

Descriptive Statistics

Indicators, N=40	Mean	Std. Deviation
The presence of a sustainable supply chain management plan facilitates the implementation GSCM	3.73	1.037
The presence of social obligations supports the implementation of green supply chain management.	3.95	.783
The presence of environmental obligations facilitates the implementation of green supply chain management.	3.73	1.176
The existence of economic obligations for lowering total supply chain costs facilitates the application of green supply chain management in dairy processing.	3.60	.841
Sum/Average	**3.75**	

Source: Own Survey, SPSS output, 2024

The least but not the last, the mean analysis shows sustainable supply chain management enables the GSCM practice. Each indicators rated by the respondents with above the median value.

Finally, among the drivers, Collaboration with suppliers (3.96) and government incentive (3.98) took the most empowering role, while availability of sustainable supply chain management strategy (3.75) is a bit weaker than others. On the other hand, among the drivers performance evaluation and reward system significantly enables GSCM Practice with a mean score of 3.92

Sample interview results also revealed that, dairy companies are expecting more from the government body to practice Green supply chain management. Regulation and incentive are the two best tools to adopt GSCM Practice. Unfortunately SSCMS is the least from the four drivers in this research. But still its mean value is 3.75, it affects GSCM even after moderately. It has high influencing driver in the implementation of GSCM Practice.

4.2 Green supply chain management Practice

4.2.1 Green Procurement

Table 7 Green procurement Practice

Descriptive Statistics		
Indicators, N=40	Mean	Std. Deviation
By working with its suppliers, the company evaluates the environmental impact of the products it procures.	3.93	.829
The company gives design specifications to suppliers, including environmental criteria for the acquired item.	3.93	.917
When making buying decisions, the company considers the environmental management protocols of its suppliers.	3.98	.920
To benefit society, the company incorporates local suppliers employees into its procurement strategy.	3.73	1.062
To meet its economic objectives, the company analyzes ways to optimize total procurement costs.	4.03	.920
Sum/Average	**3.92**	

Source: Own Survey, spss output, 2024

The first practice analyzed was green procurement practice. As mentioned earlier the main routine practice that matter GSCM in the dairy sector is green procurement.

The above table 7 tells us that green procurement is moderately entertained in the dairy companies studied in this paper with a mean of 3.92. Companies optimization of procurement cost to secure economy and designing specification for suppliers for environmental safety are both with mean score 4.03 and 3.73 respectively. Procuring environmental fit materials, suppliers environmental management protocol decision and involving local suppliers are scored 3.98 and 3.93.

The results are showing the positive impact and practice of green procurement for the green supply chain management. With the standard deviation value ranging from 0.8-1.062. Sourcing environmental material inputs is one and main enabling factor to the GSCM practice (EKIRAPA, 2022)

4.2.2 Green Transport

Table 8 Green Transports

Descriptive Statistics		
Indicators, N=40	Mean	Std. Deviation
The company is working for reduction of energy by useing fuel in order to reduce carbon emissions.	4.38	.979
Companies fairly plan sales networks to ensure that their products are delivered to customers on time.	3.92	.984
To cut transportation costs, the company produces products that are easy to distribute (packages that take up less space in shipment).	4.10	.900
Sum/Average	**4.13**	

Source: Own Survey, spss output, 2024

As mentioned earlier the one of the main routine practice that involves in GSCM in the dairy sector is green Transport.

The above table 8 tells us that green transport is significantly applicable in the dairy companies studied in this paper with a mean of 4.13. Lowering carbon gas emission and energy consumption is with the mean score 4.38 and plan sales network and on time delivery for customers is with score of 3.92. The results are showing the positive impact and practice of green

transport for the green supply chain management practice. With the standard deviation value ranging from 0.9-0.98. Resulting that it is true this practice highly enacted very well.

Finally reducing transport cost by optimizing shipment and packaging design is with mean score value 4.1. Using green transport and electric city cars had a great impact in India, the effect of greenhouse gas that we see as normal can change dramatic environmental pollution. (Khodakaram Salimifard, et.al, 2012)

4.2.3 Green Manufacturing

The main unit in the green supply chain management is manufacturing. Raw materials and processed inputs are critical to the GSCM practice. **(Thakar, 2018)**

Table 9 Green Manufacturing

Descriptive Statistics		
Indicators, N=40	Mean	Std. Deviation
Company manufacturing adopts design, uses raw resources, and converts into output with a stronger emphasis on environmental care.	4.08	.917
The company's manufacturing process assures that local society benefits from its design, raw materials, employment, and waste emissions.	3.85	.893
The company adopts design, uses raw materials, and translates them into output while optimizing its entire production cost.	3.95	.904
Sum/Average	**3.96**	

Source: Own Survey, spss output, 2024

In this section manufacturing unit currently operates a quality and food safety management system, whey production, waste treatment plant, and physical waste separation system deployed. Procedures for input materials inspection and testing, raw material testing and inspection, stock and inventory follow-up, work production, and management.

The above table reveals manufacturing is moderately practiced with amen of 3.96, designing raw materials for the emphasis of environment is with mean score of 4.08 and working with local supplier is with mean3.85 and optimizing production cost by using better design is scored with 3.95. This tells us that manufacturing is one of the critical practices in the GSCM Concept.

5.2.4 Reverse Logistics

Companies are introducing to implement RL by obeying strategic purchasing approaches, planning sales and marketing networks, gather and recycling crown cork and empty bottles, and providing the dust as fertilizer and supplying famers association with spent grain, these activities seem not significantly high. (EKIRAPA, 2022)

Table 10 Reverse logistics

Indicators, N=40	Mean	Std. Deviation
To be environmentally friendly, the company disposes of unrecyclable or non-reusable garbage (particularly hazardous waste) safely.	3.93	.944
Employees that collect large amounts of recyclable waste for best disposal or recovery of useful parts receive incentives from the company.	3.73	1.012
The Company recycles and resells (reuses) waste products to maximize the economic benefits of its reverse logistics practices for green supply chain management.	3.88	.911
Sum/Average	**3.84**	

Source: Own Survey, spss output, 2024

Reverse logistics is the movement of goods from end user/consumer to the initial production plant. These reversed goods are tends to disposed or recycled again for the production. Unless these products are properly managed they are crucial to the environmental safety and damage. Expectedly dairy companies are routinely practicing the reversed goods and recycling and disposal in the plan is common.

Respondents said application of safe removing of non-recycled waste for the environmental with mean of 3.93 is significant whereas, in the Company there is rewarding system for those who

bring unused material that can be recyclable; this question was weak with mean 3.73 when compared to other questions. Finally recycling and selling question scored 3.88 mean values.

Generally the analysis shows that GSCM (Green purchasing, green transport, green manufacturing and RL) are practiced in different rank. Primarily the movement of raw materials and delivering aspect of products or green transports is highly practiced in the dairy sector. Green manufacture and green procurement are followed with less availability in the dairy sector. The weakest practice from all is reverse logistics which is the reversal of wastage and disposed products ranked first in dairy sector with mean score 3.84. Here one can notice that reverse logistics has relevance effect to the GSCM by recycling, redistribution and disposal mechanisms.

4.3 Pearson Correlation Test

Table 11 Correlation Analysis

Correlations

		Green supply chain Practice	Government Incentive	Collaboration with supplier	Performance Evaluation and Reward	Existence of sustainable SCM Strategy
Green supply chain Practice	Pearson Correlation	1				
	Sig. (2-tailed)					
Government Incentive	Pearson Correlation	.714**	1			
	Sig. (2-tailed)	.000				
Collaboration with supplier	Pearson Correlation	.869**	.621**	1		
	Sig. (2-tailed)	.000	.000			
Performance Evaluation and Reward	Pearson Correlation	.730**	.583**	.720**	1	
	Sig. (2-tailed)	.000	.000	.000		
Existence of sustainable SCM Strategy	Pearson Correlation	.599**	.387*	.604**	.722**	1
	Sig. (2-tailed)	.000	.014	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Own Survey, spss output, 2024

A correlation analysis were deployed to determine the relationship among drivers of GSCM and its practice in dairy company. Result shows a highly strong and significant correlation among GSCM Practice and with Drivers, GSCM Practice with a driver government Incentive was

statistically important with (r = 0.714, n = 40, p = .000). GSCM Practice with a driver Collaboration with customer with GSCM Practice was statistically significant with (r = 0.869, n = 40, p = .000). Performance evaluation and sustainable supply chain management strategies are highly correlated with GSCM Practice with r value 0.730 and 0.599. p=000 for all variables.

4.6 Regression Analysis

Multiple linear regression (MLR), also known simply as multiple regression, is a statistical technique that uses several explanatory variables to predict the outcome of a response variable. Multiple regressions are an extension of linear (OLS) regression that uses just one explanatory variable. Hence, A multiple regression was used to verify the statistical feasibility of the variables after testing for assumptions.

4.6.1 Assumptions of Linear Regression Model

#1: Assumption 1: Continuous variables: Because all variables are combined to their average, they are presented in a continuous fashion.

#2: Assumption 2: There should be a linear relation among the two variables. The dispersed dot plot showed that there is a linear relationship among variables. The term "linearity" refers to a straight-line representation of the correlation among two variables. It is crucial to understand the degree of correlation between variables while analyzing data. To identify any variations that may have an impact on the correlation, examine the relationships between the variables. In statistics, linearity is determined using the P-P plot, scatter plot, and Pearson's correlations (Francis 2019). Figure 2 of the material below shows that the assumption was correct for this investigation, as evidenced by the normal plot.

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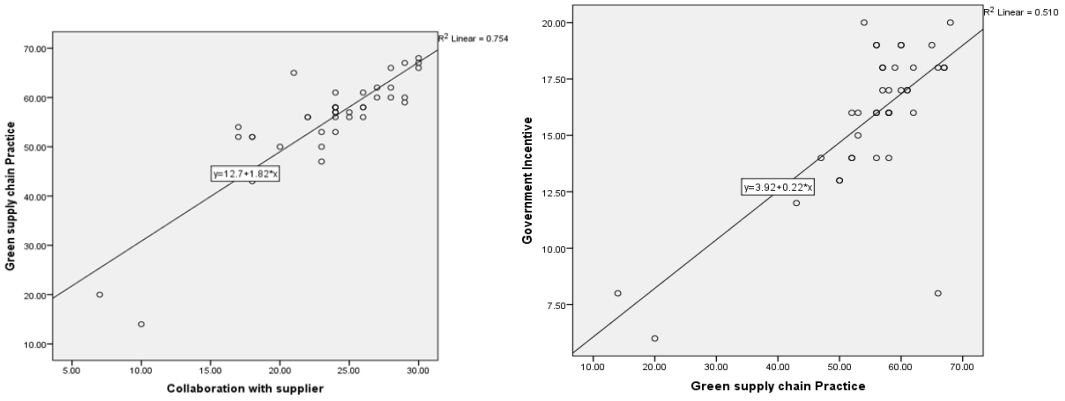

Figure 2 linear relationship between variables

#3 Assumptions 3: Homoscedasticity Test,

In homoscedasticity, all IV levels have unique amount of error variance. When the error variance changes at various IV levels, heteroscedasticity occurs. Mild heteroscedasticity, according to Francis (2019), has little effect on significance testing. However, when heteroscedasticity is high, it can substantially impair research and skew results, increasing the likelihood of a Type I mistake. The most prevalent assumption is that homoscedasticity errors have a known, limited variance that remains constant across all predictor variable levels.

In the homoscedasticity test points are scattered, it indicates errors are not accumulated at one point.

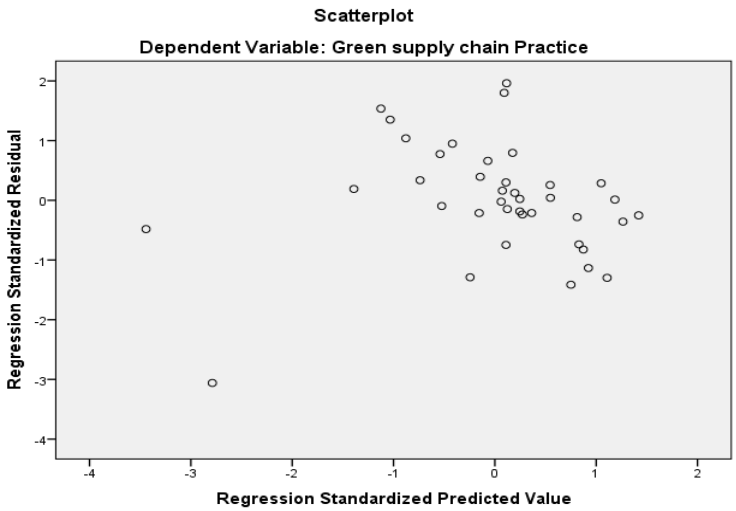

Figure 3 Homoscedasticity test

#4 Assumption Multicollinearity Test

Multi Collinearity, Indicates a relation among two predictor variables, which refers to a relationship among more than two predictor variables, it I also the presence of correlation among the predictors. When multicollinarity VIF is more than ten it tells the variables has multicollinarity, in this research the value of VIF is 3.027 with corresponding significance below 1 (Hair et.al, 2010). Multicollinarity values are shown below.

Multi Collinarity		
	Collinearity Statistics	
Model	Tolerance	VIF
(Constant)		
Collaboration with supplier	.416	2.406
Existence of sustainable SCM Strategy	.454	2.201
Performance Evaluation and Reward	.330	3.027
Government Incentive	.569	1.758
a. Dependent Variable: Green supply chain Practice		

Table 12 Multicollinatrity

#5 Assumption #5 Durbin Watson Test

The Dublin Watson value should be between 1-4, here in this case it is in the middle with a value of 2.08. This shows better result

Assumption #6 normal distribution residuals.

"normality" can be expressed in tabular and bell shape curve as shown in the diagram below symmetrical middle high and low frequencies of the data.(**(Pallant, 2020)**. In the diagram result tells a normal curve placed with affair normality distribution. This also tells us that there is no normality assumption failure.

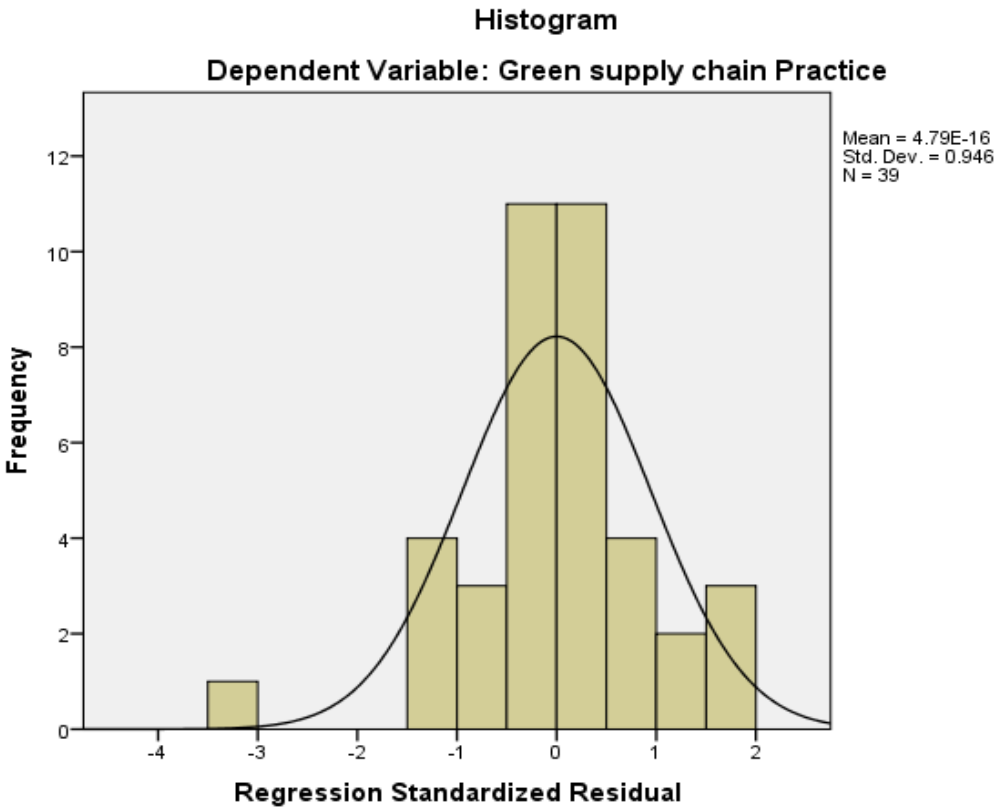

Figure 4 Normality Test

Regression Result

Results from regression reveals that drivers of GSCM occupy GSCM Practice by 86.9% and the remaining 13.1 % addressed with other factors.

Table 13: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.869[a]	.754	.748	5.34960

a. Predictors: (Constant), Collaboration with supplier

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3536.038	4	884.009	38.747	.000[b]
	Residual	775.706	34	22.815		
	Total	4311.744	38			

a. Dependent Variable: Green supply chain Practice

b. Predictors: (Constant), Existence of sustainable SCM Strategy, Government

Table 14 : Anova Test

To see and determine the regression model significances is better in explaining dependent variable, Green supply chain management practice. ANOVA is also highly appropriate by using the average as the good predictor. From the table above (ANOVA) a significant result of F=38.75 at significant level value =0.000 neatly displayed. GSCM Drivers (government Incentive, collaboration with supplier, Performance evaluation with reward and Sustainable supply chain management strategy) have a significant influence on GSCM Practice.

The result shows drivers are statistically relevant to determine. Then adoption of green supply chain practice. This implies that focusing on enabling factors can empower GSCM than trying to overcome the problems. Hence, drivers have a statistically important relationship with GSC practices.

Table 15: Regression Result

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.347	4.861		.483	.632		
	Collaboration with supplier	1.224	.236	.586	5.192	.000	.416	2.406
	Existence of sustainable SCM Strategy	.231	.387	.064	.597	.555	.454	2.201
	Performance Evaluation and Reward	.459	.488	.119	.939	.354	.330	3.027
	Government Incentive	.863	.320	.260	2.699	.011	.569	1.758

a. Dependent Variable: Green supply chain Practice

4.7 Hypothesis Testing

The proposed hypothesis was formulated in chapter two of this study. Now it is time to determine which proposed idea is get verified significant true and the rest are false or insignificant. The above regression analysis indicates that GSCM practice is dependent on enablers. This means as long as we subject enablers to the dairy company, they become serious for GSCM Practice. (By considering values from the above table all four hypothesis are accepted.)

Hyypothesis	Stand. B value	P value	Deceision
H1: Government incentives positively and significantly promote green supply chain management practice deployment.	0.586	0.000	Accepted
H2: Collaboration with suppliers positively and significantly improves green supply chain management practice enactment.	0.064	0.555	Reject
H3: Employee performance and reward systems have a positively and significantly effect on green supply chain management practices.	0.119	0.354	Reject
H4: Implementing green supply chain practices is positively and significantly correlated with the presence of supply chain management Strategy.	0.260	0.011	Accepted

Table 16: hypothesis Testing

4.8 Analysis and flow charts of GSCM Practice in Selected Dairy Sectors in Ethiopia

The process of manufacturing dairy products from the root to the fruit is as shown below in the diagram. The following information is based on the briefings from interview questions and from observation. Knowing the flow cycle of the manufacturing process contributes to develop the best fit GSCM strategy.

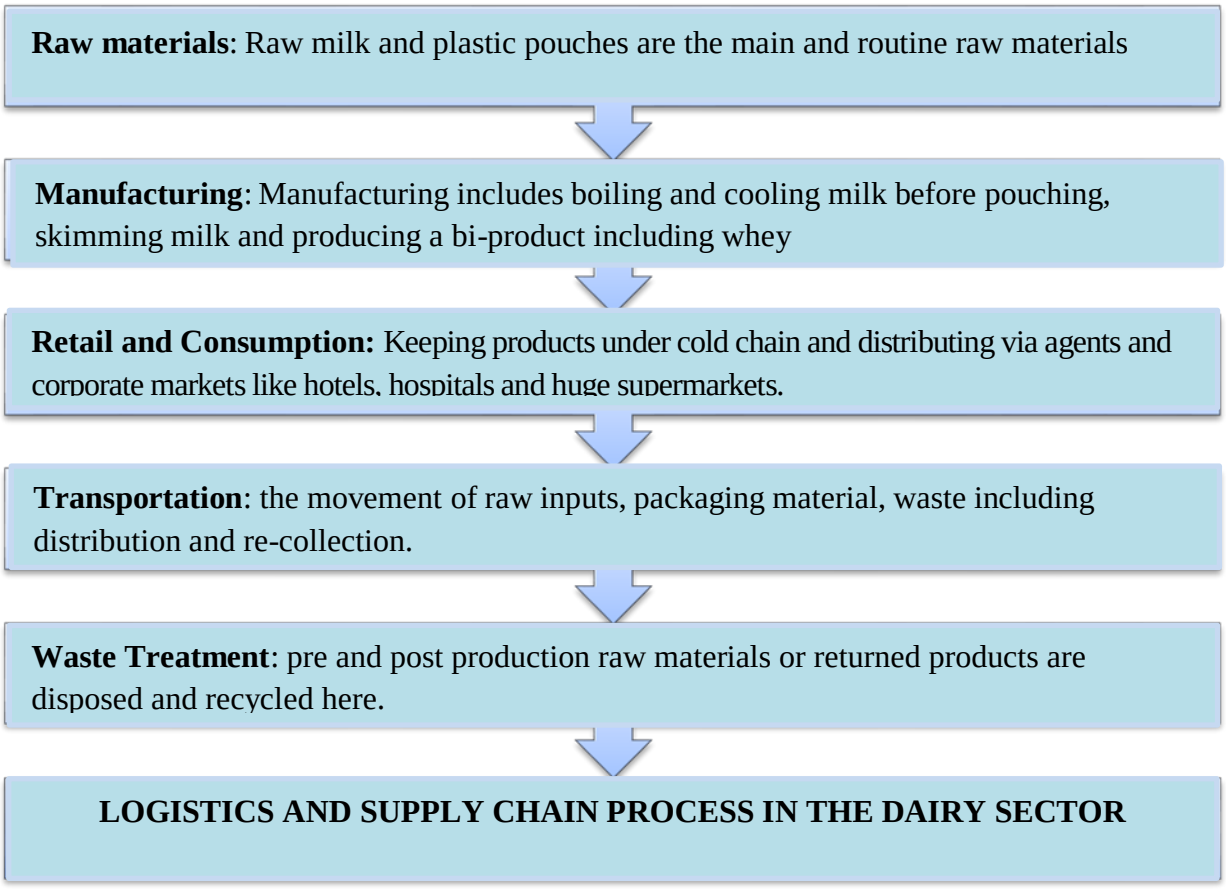

Figure 5 the life cycle in the dairy sector

Source: Own Survey, spss output, 2024

The traditional supply chain that still applied in the researchers study area is shown in the diagram below. It indicates that the wastage and environmental damaging starts from the manufacturing point, immediately after the raw materials are received to the manufacturing plant.

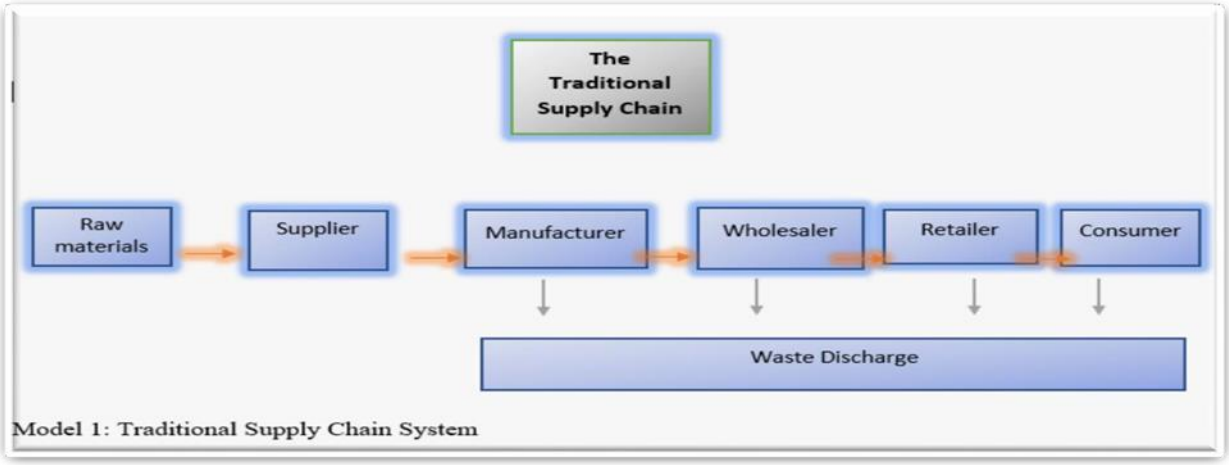

Figure 6 The former supply chain flow

Source: Own Survey, spss output, 2024

Based on the above two diagrams the following assumptions are raised as a model for the best implementation and practice of green supply chain management.

Analyzing in such way enables to track each production activity and make green effect at each point. Green distribution network and recycling damaged vehicles as well as using energy efficient vehicles are some of green transport practices. Select and create long term relationship with suppliers and mobilize them to GSCM May help the practice. Plastic pouches, yoghurt cups and foils are common waste materials in the industry. In the dairy food sector the packaging materials are thrown away everywhere, if the companies give incentives to those who collect and bring to the recycling hub, it could create best reverse logistics in the GSCM Practice.

Some GSCM Practice startups in the dairy company that the researcher observed

Figure 7 Abio-digester plant in Zagol Milk and Dairy farm.

Source: Own Survey, a photo shoot by the researcher, 2024

Abio gas Generator that generates 80 KVA electricity, and they can substitute electricity resources. This bio gas generator uses cow dung as input and after the methane gas (CH4) separated in to the balloon, so that it connects to a generator and power started to generated. This secure the environmental damage through

Figure 8 Waste treatment plant in Zagol Milk and Dairy farm

Source: Own Survey, a photo shoot by the researcher, 2024

This is waste treatment mechanism separates the dirty seepage and clean water, finally the company uses the pure water again for cow feed grass development

CHAPTER FIVE

5 DISCUSSIONS, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY AND CONCLUSION

The study addresses the drivers of green supply chain management practice in selected dairy industry in Ethiopia. In the research census method (purposive sampling) was been applied to for sample size of 40 higher level managers, middle Level managers and experts in the companies. Data were collected with 0% attrition rate, with 97% of the respondents literacy level is bachelor degree and above. 85% respondents are experienced for more than 2 years in the field/study area.

Respondents were asked to answer two sections that are how looks the green supply chain practice, what actions could enable green supply chain practice of practicing green supply chain management. Five likert scale questions were distributed with option (1=strongly dis agree, 2=dis agree, 3= Neutral, 4 agree, 5= strongly agree) arranged positively.

The data analysis tells that from GSCM practices (green purchasing, green transport, green manufacturing and RL) are highly dependent on GSCM drivers (Government Incentive, collaboration with Supplier, performance evaluation with rewards and Sustainable supply chain management strategy). When we come to the drivers/enablers all enablers in the questionnaire are significantly important to enhance the green supply chain practice in the dairy sector. Specially collaborating with suppliers and government incentive are the main enablers as per the analysis. The main obstacles for the GSCM practice. Analysis indicates adding reinforcement and reducing regulations from the government body can create a medium of GSCM Practice in the companies.

5.2 RECOMMENDATION

As a researcher a Separating significant driver for each GSCM Practice should be formulated. Below I tried to narrate what mechanism and system should be developed under each practices of GSCM. Moreover based on the findings from respondents some recommendations are made.

Government Incentive involvement in green Manufacturing: results in this research shows that is government incentive is the main and mostly impact the practice of green supply chain management in the dairy sectors. It has a big role of government incentive in the manufacturing process that is: scanning the detail process in the manufacturing unit like overview stage, eco-profile stage, department network stage, qualification stage, conceptualization and then green production stage. Analyzing in such way enables to track each production activity and make green effect at each point.

Government incentive in green Transport: in the research many suggestions and recommendations are discussed as a result of existing practice and observations. Green based network design, re usage of damaged vehicles after recycling and energy efficient fleet are some of green transport practices. If the government capable those energy efficient customers green transport will be effective.

Collaboration with suppliers in Green Procurement: The study reveals greening is highly engaged with the root of the materials supply. Therefore; Strategic sourcing and stick with a supplier that only working with environmental friendly products.

Sustainable SCM Strategy for Reverse Logistics: From the research the researcher shows that, plastic pouches, yoghurt cups and foils are common waste materials in the industry. In the dairy food sector the packaging materials are thrown away everywhere, if the companies give incentives to those who collect and bring to the recycling hub, it could create best reverse logistics in the GSCM Practice. Therefore collaboration with customer is one driver in the GSCM Practice. Strategic collection and recycling can enhance GSCM.

5.3 FURTHER STUDY IMPLICATION

Environmental sustainability is an important concern in today's globe. Previously, environmental protection was neglected, resulting in deterioration. Over the last decade, a trend of environmentally friendly businesses has emerged. Researchers aim to uncover good outcomes related with the implementation of GSCM methods. There may be limitations to this research, but they also present opportunities and direction for future research.

It suggests that broad hypotheses may not explain for all specific correlations that require further exploration. Second, because this study is conducted from the standpoint of a manufacturing firm in the supply chain, the associated economic and environmental benefits are discussed with the manufacturer, which is considered the primary company. Future study can also be undertaken from the standpoint of other units in the supply chain. Comparing the performance of the manufacturing and providing companies can provide additional insight into this area. Third, the study has a small sample size and should be reproduced in a bigger group.

Fourth, are longitudinal data useful in determining whether the effects of variables are short-lived or permanent? Longitudinal data can show how changes in certain variables can affect economic and environmental outcomes.

Finally, the overall findings imply that green supply chain management methods are an intriguing field of research and practice, opening up new research opportunities. Greater external demands from various stakeholders, as well as the organization's internal voluntary environmental policies, motivate enterprises to effectively employ GSCM techniques, resulting in improved environmental and economic performance. Firms may avoid implementing environmental policies if they do not respond to external pressures from numerous stakeholders, which can have a detrimental impact on performance and reputation.

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APENDEX

Addis Ababa University

College of Business and Economics

School of Commerce

Department of Logistics and Supply Chain Management

Dear Sir/Madam

Acknowledgement to the respondent:

Without your diligent assistance in completing this questionnaire, the research could not have been carried out. Please accept my sincere gratitude.

I am Endegena Abera, student from Addis Ababa University, college of Business and Economics: School of commerce. Currently I am carrying out research in partial fulfillment of requirements for the award of a master's degree in Logistics and supply chain management.

This survey intended to gather information on Green Supply Chain management practice challenge and enablers with particular reference to manufacturing Sector. The level of the study is to ascertain the degree to which your company has embraced GSCM Practice and what challenges you face with green supply chain management. Information obtained from this study will be used only for academic purpose and will be handed in most secured and confidential way. Dear respondent your participation is voluntary, and I can guarantee that the data we collect will be kept private and anonymous. Your involvement will be greatly valued. In case of any questions, please call me on 0911634731 /Email, surafelab21@gmail.com

SECTION 1: Respondents Demographic Profile

The following questions are about the respondent's profile in the organization. Kindly indicate the appropriate characteristics of the respondent profile using √

1. Age

   □ below 18 years □ 18-25years □ 26-35years □36-45years □ 46years and above

2. Educational background

   □ Diploma and below □ Bachelor Degree □ Master's degree and above

3. Work experience

   □ Below 2 years □ 2-5 years □ 6-10 years □ Above 11 years

SECTION 2: Green supply chain management practices

The following questions are about the existence of Green Supply Chain Management Practices in your organization. Please indicate the level of your agreement or disagreement using **(√)** on the following statements based on your experience in your company on the following supply chain practices. (1=strongly disagree, 2=Disagree 3=Neutral 4= Agree 5= strongly agree)

Green supply chain management practices		**Scale**				
Code	***Green Procurement Practice***	***1***	***2***	***3***	***4***	***5***
GPP	Company considers the environmental impact of product to be Procured by collaborating with its suppliers.					
	Company provides design specification to suppliers that include Environmental requirements for purchased item.					
	Company assesses supplier's environmental management Protocols in its procurement decisions.					

	Company involves local suppliers (raw material suppliers and Employees) in its procurement to benefit the society.					
	Company considers means of optimizing the total procurement cost to secure its economic objectives.					

Code	***Green Transportation Practice***	***1***	***2***	***3***	***4***	***5***
GTP	Company considers reduction of energy consumption (fuel) to Reduce carbon emission.					
	Company reasonably plan sales networks that would help to avail their product on time to consumers.					
	Company designs products in an easy way to deliver (designing packages that require less space in shipment) to reduce transportation Cost.					
Code	***Green Manufacturing Practice***	***1***	***2***	***3***	***4***	***5***
GMP	Company production adopts design, uses raw materials and Converts into output with greater emphasis to environmental consideration.					
	Company production process ensures how the local society benefits in its design, raw material, employment and wastage Emission.					
	Company adopts design, uses raw materials and converts into Output by optimizing its total production cost.					
Code	***Reverse Logistics Practice***	***1***	***2***	***3***	***4***	***5***
RLP	In the Company there is safe disposal of unrecyclable or un re-usable Waste (especially hazardous waste) to make environmental friendly.					
	In the Company there is incentives to employees who collect sizeable Amounts of recyclable materials for proper disposal or recovery of useful parts.					

	In the Company there is recycling and reselling (reuse) of waste materials to enhance the economic benefits of its reverse logistics Practices of green supply chain management.					

SECTION 3: - Enablers of Green Supply Chain management

The following questions are about enablers of green supply chain management practices implementation. Please indicate the enablers and challenges of supply chain management practices implementation faced at company level using **(√)** on the following statements. (1=strongly disagree, 2=Disagree, 3=Neutral, 4= Agree, 5= strongly agree)

Enablers of Green Supply Chain management		***Scale***				
Code	***Government Incentive***	***1***	***2***	***3***	***4***	***5***
GI	Government incentives enable the implementation of green supply chain Management at Company.					
	Subsidy polices of the government enable the implementation of green Supply chain management at Company.					
	Reducing taxes in adoption of technology that would ensures the economics, societal and environmental benefits enable the implementation of green supply chain management at Company.					
	Governmental environmental regulations on the brewery industry enable the implementation of green supply chain management at Company.					
Code	**Collaboration with supplier**	**1**	**2**	**3**	**4**	**5**
CS	Collaboration with supplier enables the implementation of green supply chain management at Company					
	Supplier's commitment to the design requirement Company in terms of Economic, social and environmental friendly specifications enable the implementation of green supply chain management at Company.					
	Suppliers adoptability to the green supply chain requirement of					

	Company enables the implementation of green supply chain management at Company					
	Cooperation with customer for eco-design, green packaging enables the implementation of green supply chain management at Company.					
	Cooperation with customers for using less energy during product transportation enables the implementation of green supply chain management at Company					
	Environmental partnership with suppliers enables the implementation of green supply chain management at Company					
Code	**Performance Evaluation and Rewarding System**	**1**	**2**	**3**	**4**	**5**
PERT	Performance evaluation and rewarding system in the organization enables the implementation of green supply chain management.					
	Setting performance standards in the organization enables the Implementation of green supply chain management.					
	Setting specific goals related to green supply chainmanagement practices in the organization enables the implementation of green supply chain management.					
	Motivational acknowledgement and bonuses for the adoption of green supply chain management practices enables the implementation of green supply chain management.					
Code	**Existence of sustainable supply chain management strategy**	**1**	**2**	**3**	**4**	**5**
sscm	Existence of sustainable supply chain management strategy enables the implementation of green supply chain management.					
	Existence of social responsibilities enables the implementation of green supply chain management.					
	Existence of environmental responsibilities enables the implementation of green supply chain management.					

	Existence of economic responsibilities to reduce the total supply chain cost enables the implementation of green supply chain management in the dairy sector.					