Impediments of Green Supply Chain Management Implementation in

Addis Ababa Tannery Companies

By

Amha Zewdu

A Thesis Submitted to Addis Ababa University School of Commerce in Partial Fulfillments of the Requirements for the Degree of Master of Art in Logistics and Supply Chain Management

Addis Ababa University School of Commerce

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Addis Ababa,

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ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DECLARATION

I, the undersigned, declare that this thesis entitled "***Impediments of Green Supply Chain Management Implementation in Addis Ababa Tannery Companies"*** 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

IMPEDIMENTS OF GREEN SUPPLY CHAIN MANAGEMENT IMPLEMENTATION IN ADDIS ABABA TANNERY COMPANIES

Approved by Board of Examiners

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External Examiner	***Signature***

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List of Acronyms

GSCM; Green Supply Chain Management

LIDI; Leather Industry Development Institute

CSA; Central Statistics Agency

GTP; Growth Transformation Plan

CRGE; Climate Resilient Green Economy

UNIDO; United Nations Industrial Development Organization

ISO; International Organization for Standardization

CSR; Corporate Social Responsibility

EMS; Environmental Management System

EIA; Environmental Impact Assessment

VIF; Variance Inflation Factor

ABSTRACT

Green supply Chain Management has emerged as a trending topic of discussion for the Organization development, enhanced competitive advantages, increase customer satisfaction, improved brand image, and of course minimum adverse impacts on the environment. However, Green business practices are not easy to adopt and implement, due to the presence of many barriers. Identification of essential barriers for Green Supply Chain Management implementation is also difficult because of its numerous characteristics. The purpose of this study was to examine the main impediments of green supply chain management implementation in Addis Ababa Tannery Companies. In order to attain the objectives of the study, mixed approach was entertained. As a means of data collection instrument; questionnaire and structured interview questions were applied. The population of the study were 49 employees of 7 tannery companies in Addis Ababa, mainly those at managerial position and responsible either directly or indirectly for the supply chain activities of the company. All the population taken as a sample; from a total of 49 questionnaires distributed, only 42 of them were correctly filled and applied in the study, and this revealed a response rate of 85.71%. The interviews were conducted with Environmental Technology Directorate, Director of Leather Industry Development Institute (LIDI) and Deputy Manager of City Government of Addis Ababa Environmental Protection Authority. In order to analyze, interpret and present the data captured via questionnaire, Statistical Package for the Social Science (SPSS) were used. The quantitative data were analyzed using mean, mode, standard deviation, correlation and regression analysis. The findings of the study revealed that; the existence of statistically significant negative association between the impediments and implementation of green supply chain management. The regression result also showed that except the financial barrier; company's lack of perception on environmental impact towards implementation GSCM, technological, organizational and informational barriers have statistically significant predicting power on the implementation of GSCM. With regards to the hypothesis testing the Chi-square test of independence was employed. The result revealed that; there exist significance relation between the dependent and all independent variables. Thus the entire null hypotheses were rejected.

Key Terms: Impediments, Green Supply Chain Management, Tannery Companies.

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Supply Chains encompass the companies and the business activities needed to design, make, deliver and use a product or service. Businesses depend on their supply chains to provide them with what they need to survive and growth. Every business fits into one or more supply chains and has a role to play in each of them. The pace of change and the uncertainty about how markets will evolve has made it increasingly important for companies to be aware of the supply chains they participate in and to understand the role that they play. Effective supply chain management requires simultaneous improvement in both customer service level and the internal operating efficiencies of the companies in the supply chain Michael Hugos (2003).

According to Singh B., Singh N., and Siniha P. (2017), the concept of GSCM is to integrate environmental thinking into supply chain management (SCM). Green supply chain management (GSCM) is considered as an environmental innovation. GSCM aims to minimize or eliminate wastages including hazardous chemical, emissions, energy and solid waste along supply chain such as product design, material resourcing and selection, manufacturing process, delivery of final product and end of life management of the product. GSCM plays a vital role in influencing the total environment impact of any firm involved in supply chain activities and thus contributing to sustainability performance enhancement.

Fahimnia, Sarkis, and Eshraga (2015), stated that, governments and industries are trying to engage economic developments and growth with environmental issues. This philosophy "green growth" was a central discussion at the recent United Nations conference on sustainable development. Green Supply chain management (GSCM) has been viewed as one area where organizations and industries can make significant contribution to both economic and environmental development. Furthermore, Sarkis (2002) argue that Green supply chain decisions are one of the latest issues that strongly challenge the organizations internally and externally.

Industrialization has a direct relationship with the increase of pollution. According to Ethiopian Central Statistics Agency (2003) there are around 2,488 industries started their operation in Ethiopia industrialization processes these contributed a great opportunities for the economic development, besides economical benefit some industries polluting the environment mainly water bodies. As the result these pollutants mainly change the characteristics of water into acidity, salinity and turbidity Patric, Wondwosen and Pierre (2016).

In relation to this Birhanu (2017) explained that in Ethiopia 90% of the industries are releasing their effluent into water bodies, streams and these would be cause of water pollution, Moreover, according to C.S.Roa. (2009), modern technological development also contribute hazardous situation to human health. Nearly 5 million chemicals have been produced in the world in the last 40 years and some 50,000 to 70,000 chemicals are used extensively in millions of different commercial products without the availability of proper toxicological information on the majority of chemicals. From health perspective ,Tom & Lynne (2015) when they stated, for developing countries due to different reasons water pollution control is very complicated so that deaths from water borne diseased 1.6 million was recorded in 2003 and most of them were children under 5 years old.

Tekelit G. (2015) explained about the range of the tannery effluents in Ethiopia, they are the highest ranked pollutants among others. The industrial wastes it is estimated that in Ethiopia alone about 200-300 tone of chromium released with chromium concentration range between 2000 and 5000 mg/lit in the aqueous effluent compared the permissible limits of 2mg/lit. So that Ethiopia is one of contributor for chromium pollution. As previously demonstrated Mekonnen, Seyoum and Mohammed (2017) the total waste water discharge estimation from tanneries' is about 400 million m3/year and 90% of the world leather production used chrome for tanning processed. In these process tanneries utilized chromium in the form of basic chromium Sulphate to finalize the leather to be flexible during this process and 60% - 80% of chromium reacts with the hides and 20% - 40% of the chromium remaining in the sold and wastes. The main problems happening in the tanneries industry because of the waste water containing heavy metals, toxic chemicals, chloride, lime with high dissolved and suspended salts and other pollutants. In this regard, Benti, Yonass and Teshome (2016), explained that contaminant within the water may reduce the yield of crops, and hazardous to human when they enter into the food chain. In

addition, toxic form of chromium can be the cause for lung cancer, high concentrations of aluminum (Al) it may be the cause for Alzimer disease and Zinc may also cause for muscular pain and intestinal hemorrhage.

1.2. Statement of the Problem

The expanding of global economy does not consider the environmental issues as the result of which a great environmental degradation occurred in the world. Since firm's stakeholders like that of regulatory authority, customers, competitors, non-governmental organizations and employees are increasingly demanding firms to implementing environmental and social sustainability in their business operations. So that the issues have became important. Sini Laari (2016). In favor of this idea Qinghva, Joseph and Yong (2005) stated that balancing economic and environmental performance has become increasingly important to firm in order to overcome competitive, regulatory and community pressures. When increased pressures for environmental sustainability, it is expected that industries need to implement strategies to reduce the environmental impacts of their products.

In addition, today's environmental issues are increasingly related to international trade and market. Customers worldwide are demanding environmentally friendly products. The environmental concerns such as toxic waste should be addressed together with supply chain management and considered as an important element in production processes for industrial growth Thoo, Tat and Zuraidah (2015). In relation to this idea, Arvind and Mohd (2014) stated Green supply chain management (GSCM) is an approach to improve performance of the process and products according to the requirements of the environmental regulations. It is also an important organizational Philosophy that plays a great role towards promoting efficiency, minimal waste, proves the ecological efficiency and makes a good relationship among the firm's partners.

According to EPA (2012) Ethiopia has a great vision to achieve middle income status by 2025 while developing a green economy. Ethiopia's Climate Resilient Green Economy (CRGE) vision and strategy formulated from the constitution and the environment policy of Ethiopia and approved in 1994 and 1997 respectively. Global circulation model predict a 1.7-2.1^{o} c rise in

Ethiopian's mean temperature by 2050. This could cause food insecurity, outbreak of diseases such as malaria and cholera, land degradation, malnutrition and damage to infrastructure.

The unpublished document produced by the leather industry development institute (LIDI) (2014) indicated that leather sector in most Africa countries in general and particularly in Ethiopia, is one of the potential that contribute for economic development. Thus, hides and skins are the most important raw materials for the sector besides Ethiopia has potential based on its huge livestock wealth. Moreover, in order to uses this resource the Federal Democratic Republic of Ethiopia is working forwards promoting export trade and meet up the target set on Growth and Transformation Plan (GTP). Therefore, special emphasis has been given to the sector in order to get significant amount of foreign exchange, since Ethiopia has a potential of the basic raw material raw hide and skins.

The leather soaking and tanning industry emerged with the establishment of the then Asco tannery (the current Addis Ababa Tannery) in 1918.Since the government has given great attention and priority for the leather sector and establishment of Leather Industry Development Institute (LIDI) with the main objective for the leather sector development and competitive of the sector in the global area. Currently, in Ethiopia, there are above thirty tanneries converting hides and skins into different types of finished leather and Seven (7) of them found in Addis Ababa. There is also a possibility of producing more than 500 million square feet of finished leather per year.

According to Zellalem (2015) the government regulatory organization established a standard at national level, however almost all tanneries do not follow the requirement of the standards as well implementing the green supply chain management practice. If tanneries want to have social legitimacy, business sustainability, and competitive advantages, they have to consider green supply chain management.

Although the above studies provide some evidence of evaluating greening factors, none has exclusively investigated the main impediments of green supply chain management among tanneries. Thus, this study intended to investigate the impediments of the implementation of green supply chain management in Addis Ababa's tannery companies.

1.3. Research Questions

The study attempted to address the following research questions:

1. What does the current status of the tannery companies in Addis Ababa looks like?
2. Which barriers have the greatest and least impediment to the implementation of Green Supply Chain Management in Addis Ababa tanneries companies?
3. Are there any relationships and predictability among on company's lack of perception no environmental impact, Organizational, Technological, Financial, and Informational barriers; and Implementation of GSCM in Addis Ababa tanneries companies?

1.4. Hypothesis

Hypostasis1. Company's lack of Perception on environmental impact has no significant relationship with the implementation of green supply chain management.

Hypostasis2. Organizational barrier has no significant relationship with the implementation of green supply chain management.

Hypostasis3. Technological barrier has no significant relationship with the implementation of green supply chain management.

Hypostasis4. Financial barrier has no significant relationship with the implementation of green supply chain management.

Hypostasis5. Informational barrier has no significant relationship with the implementation of green supply chain management.

1.5. Objective of the study

1.5.1. General Objective of this study

The general objective of study is to examine the hindrances of Green Supply Chain Management implementation in Addis Ababa tannery companies.

1.5.2. The specific objectives

In particular, the specific objectives of this study are to:

1. To identify the major barriers to implementation GSCM in Addis Ababa Tanneries companies.
2. To review the relationship of company's lack of perception on environmental impact, organizational berries, technological barriers, financial barriers, and informational barriers towards implementation of GSCM in Addis Ababa Tanneries companies.
3. To identify the possible opportunities of implementing GSCM in Addis Ababa Tanneries companies.

1.6. Significant of the study

The researcher assumes that the study will create awareness about the concept, activities strategies, and benefits for the implementation of green supply chain management for Addis Ababa Tannery Companies. The result of this study will give an insight to any individual who has interest on Green Supply Chain Management and to undertake further study on the area. Moreover, it will produce an empirical finding on the areas of green supply chain management to the scientific community. This study might also give green -light for academician to further research on related areas in Addis Ababa tannery business context. Generally, the results of the study will be useful to the following categories:

- ✓ The research findings will help to show a way to improve the implementation of Green Supply Chain Management in the companies of Addis Ababa tanneries.
- ✓ The research findings will contribute a lot for different stakeholders such as policy makers, and regulatory organizations.

- ✓ The others significance of this study will be giving insight to other researchers for their extension of investigation on this topics,

1.7. Scope of the study

The existing literature shows many different perspectives of green supply chain management practices. This is would be helpful to understand whether the main impediments are the reasons that refrain tannery companies from the implementation of GSCM. The study focuses on identifying the impediments of Green Supply Chain Management (GSCM) in Addis Ababa tannery companies. Even though there are above thirty tannery companies throughout Ethiopian, due to time and cost limitations the study delimited to Addis Ababa tannery companies relevant to carry out this study. This will encourage the tanneries further to put into practice green practice in their companies to achieve the company and country's goals and vision.

1.8. Limitation of the study

Lack of related books, manuals, reports, and other references on the topic as well lack of previous researches in the area and the tanneries in Addis Ababa where located in different places. In addition busyness of the key personnel that contributes different ideas related to the topic.

1.9. Definition of Terms

Pollution is defined as an unfavorable alteration of the environment from the effects of changes in energy patterns, radiation level, chemical or physical constitution or the abundance of organism Khoker (2007).

GSCM's definition has ranged from green purchasing to integrated supply chains flowing from supplier, to manufacturer, to customer and reverse logistics, which is " Closing the loop" as defined by Qinshua, Joseph, & Yong (2005)

1.10. Organization of the Research Report

This research report is organized into five chapters. The first chapter deals about introduction which contain background of the study, statements of the problem, research questions, hypothesis, objectives of the study, significance of the study, scope of the study, limitation of the study, and definition of terms. The second chapter deals with the literature and theoretical reviews and conceptual framework. It gives an overview of the body of knowledge applicable to the research problem. The previous related studies conducted on the topic under investigation were critically narrated. Chapter three describes the research methodology. It holds the research approach, research design, research participants, population size, method of data collection, source of data, method of data analysis, validity and reliability and ethical clearance used to answer research questions. Chapter four deals with data presentation, analysis and interpretation .The final chapter contains summary of major findings, conclusions, recommendations and limitation and suggestion for future studies. Finally, list of references and appendixes are annexed.

1.11. Chapter Summary

In brief, this chapter has provided a background of the study, and the next chapter will present the literature review which is related to the study. This introductory chapter presents the background of the study, statements of the problem, research questions, hypothesis, and objectives of the study, significance of the study, scope of the study, limitation of the study, definition of terms and organization of the thesis.

CHAPTER TWO

REVIEW OF RELATED LITERATURES

Introduction

Chapter two presents relevant to the study literature review. The literature review part contains conceptual frame of the study concerning the theoretical frameworks by which the overall research tasks guided. It also covers some empirical literature review which helps in getting practical experience that could be taken as lesson and use full in making future recommendations.

2.1. Evolution of GSCM

According to Srivastava (2007), in early environmental management frameworks, production managers focus only on their production increment rather than considering the environmental influencing. Separate organizational units had concerned on environmental through development of product, process design, operations, logistics, regulation, marketing, and waste management. Today, through the revolution of 1980s and 1990s for quality and supply chain respectively, the integration of environmental management with ongoing operation has become practiced. GSCM is becoming interested among the researcher and practitioners of operation and supply chain management. GSCM is growing importance mainly driven by alarmingly deterioration of the environment, depletion of raw material resources, overflowing waste sites and increasing levels of pollution. Moreover, Noor *et al.* (2012), they argued that the current changing in environmental requirements that influenced manufacturing activities had increased attention in developing environment management strategies for the supply chain. Thus, the concept of GSCM arises as a new systematic approach and becoming an important factor for business activities today. Nowadays, most organizations are starting to go green in their business as concern to environmental sustainability. They have realized the greater benefit of the green technology adoption in business operation, which also affected suppliers and customers.

2.2. Green SCM Concepts

According to Srivastava (2007) GSCM had its roots in both environment management and supply chain management literature .Adding the "Green" component to supply chain management involves addressing the influence and relationships between supply chain management and the natural environment. Outstanding features of leading green supply chains include an emphasis on life cycle costing, assets efficiency, and waste reduction and service innovation and recycling, executed effectively, GSCM stimulates products and service innovations, improves asset utilization, and strengthen customer relationships and service levels through a shared focus on reducing waste and cost. Hartmut and Christoph (2010) P11: also defined GSCM as "…net work of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer". Norlinda *et al.* (2015) have stated that GSCM able to use as a strategy to minimize the negative impact on the environment through activities within the organization and supply chain .Moreover, implementation of GSCM helps the organization enhance information sharing capabilities that provide a competitive advantage to the organization along with the process of environment sustainability. Ali and Govindan (2011) argued that green supply chain management is the process of incorporating environmental concerns into organizational supply chain management activities and long term relationships with suppliers. Furthermore, the concept of green productivity shows that any development strategy to be sustainable, it has to focus on environment, quality and profitability.

According to walker *et al.* (2008), the green chain concept covers all phases of a product's life cycle, from the extraction of raw materials through the design, production, and distribution phases, to the use of the product by consumers and its disposal at the end of the product's life cycle. Kishore (2015) further explained that supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to customer. Green supply chain management practice, which integrate environmental concerns, into organizational purchasing decision and long term relationship with suppliers. Green supply chain management mandates to incorporate the environmental idea in each and every stage of the product and service in a supply chain.

2.3. Drivers of GSCM Implementation

According to Zhu, Yijie and Sarkis (2010), external pressure and internal incentive can trigger focal companies to implement GSCM program. In relation to this W.Nieman, T.kotze and F.Adamo, (2016) they stated that the major drivers of GSCM implementation such as Government rules and legislation, Green image and competitive advantage, public pressure and customer awareness and pressure, social and environmental responsibility, and economic benefits,

Government Rule and Legislation

The rule of law is a system of government where a society adopt asset of good ,just and fair laws on which the society and its government is then governed. Thus, government has the power to act as drivers in the implementation of GSCM in three aspects. First, the government needs to engage in transparence environmental regulation, second, the government should promote green innovation in the most significance area of GSCM the last one the government needs to engage in activities that educate ordinary citizen on the need for creating green and cleaner environment. W.Nieman T.kotze and F.Adamo, (2016)

Green Image and Competitive Advantage

Green image is a driver of GSCM that provide a "greening image " where a manufacturing product is to be used importantly, green image refers to the positive recognition by customers of organizations that engage in the manufacturing processes that are environmentally friendly. GSCM implementation can improve both the image and reputation of the organization simultaneously. Chin, Tat and Suleiman (2015)

Public Pressure and Customer Awareness and Pressure

Customers are becoming increasingly aware of the negative impact caused by certain business activities on environment. The public and customers exert pressure on organizations to implement greener supply chains, ultimately reducing the harm wastes to the environment. Moreover, the media plays a vital role in informing and educating the public on environmental degradation, and pollution, therefore customers concern themselves with environmental issues at an increasing rate. This drives organizations to look at the implementation of GSCM practices

and affects the entire manufacturing process from design to the end life of the products. Nieman *et al.* (2016)

Social and Environmental Responsibility

In current markets, organizations feel socially and environmentally responsible and engage in corporate social responsibility (CSR). Negi and Anand (2014), argue that the companies are getting more attention as sustainable development mode for modern enterprises, increasingly a part of corporate social responsibility (CSR) initiatives and investing to achieve greener supply chain which can be waste eliminating, productivity improving and saving resource.

Economic Benefits

Economic benefit can be a driver of GSCM and represents the ability to reduce until costs of manufactured goods or services rendered without affecting its intended use or reducing the product's quality. It is important to consider that cost reductions should not be associated with reduction in the quality of product. The removal of non-value adding component of product can lead to cost reduction. Economic benefit can further be obtained by using less energy, water and raw material in the production process, which will not only preserve the environment but also lead to a reduction in production cost. Nieman *et al.* (2016)

2. 4. Benefits of implementing Green Supply Chain

According to Raagul and Jawagar (2016) when companies improve their manufacturing activities besides sustainability performance, they will have tremendous benefits. Such as financial benefits these includes operating cost, increase revenue, lower administrative cost, lower capital cost and stock market premium. In relation to customer related benefits include increased customer satisfaction; produce innovation and increase in market share improve reputation and new market opportunity. With respect to the operational benefits, process innovation, productivity gains, reduce cycle time, improved resource yield, and waste minimization mentioned the main ones. In additions to these, employee satisfaction, improved stakeholder relationship, reduced regulation intervention, reduce risk and increase organizational learning also mentioned as organizational benefits. Mohd J., and Mohd S., (2015) argued that through implementation of green sourcing and procurement, green manufacturing, green

packaging, green warehousing, green distribution, and green transportation companies can controlling air pollution, reduction of wastes, and improving quality of products. Daulatrao (2017), further argued that, reducing the consumption of toxic chemicals, less waste, sustainability of natural resources, lower cost, increased efficiency, product differentiation, brand reputation, reducing rick, keeping employee morale and ethics some of the benefits of GSCM implementation. Singh *et al.* (2017), also mentioned that sustainability of resources which is effective utilization of the available productive resources of the organization, competitive advantage, and improved quality of products among others benefits of GSCM,

2.5. The Impacts of the GSCM on Organizational Performance

Ethiopia has been achieved successive double –digit economic growth for the decade. This miracle economic development cannot really be meaningful unless it is sustainable. The environmental impact assessment process which originated in the united state in the late 1960 s has been adopted extensively in the rest of the world. In Ethiopia by constitutional principle and environmental policy the environmental impact assessment (proclamation number 299/2002) was made in order to predict and manage the environmental effects.

According to Ardian Qorri *et al.* (2018), environmental management is an important issue in supply chain management (SCM). Manufacturing processes include sourcing, manufacturing, distribution, marketing, information system and reverse logistics. All these processes should be strategically aligned with environmental standards and concerns from government regulator, customer, and competitors to mitigate the risk of environmental hazards and reduce adverse publicity due to non-compliance with associated government penalties as well as improve supply chain performance. With competition at supply chain level and since the focal company is often held responsibility for the adverse environmental impact of all organization in its supply chain that is necessary to indentify and adopt GSCM practices that yield competitive advantages. Thus, GSCM practices consist of different type of activities and initiative under taken by companies to cope with institutional pressure and to improve the overall performance of the company and in turn the overall SC performance.

Zhu *et al.* (2005) argued that Limited research still indicates a positive relationship between environmental management and operational performance. Environmental management system is an innovative environmental policy and information management tool for industry to improve

organizational operational performance and through implementation of ISO 14001 firms can have a strong relationship between meeting operational goals and staff involvement on environmental management.

Purba and Diane (2005) further argued that Environmental management encompasses diverse initiatives to reduce or minimize the adverse environmental impacts of an organization's operations. These efforts aim to improve environmental performance, reduce costs, enhance corporate image, reduce risks of non-compliance and improve marketing advantage. However, many organizations still look upon green initiatives as involving trade-offs between environmental performance and economic performance. The financial performance of firms is affected by environmental performance in a variety of ways. When waste, both hazardous and non-hazardous, is minimized as part of environmental management, it results in better utilization of natural resources, improved efficiency and higher productivity and reduces operating costs.

Environmental performance, it implies that greening different phases of the supply chain should directly, or indirectly, translate into enhancement of economic or financial performance. At the same time it is not necessarily true that greening all the phases of the supply chain should directly lead to financial performance. For instance, greening the inbound phase certainly should lead to reduction of pollution at the source and minimization of wastes. However, whether these initiatives have a direct impact on financial performance is yet to be explored. Similarly, greening of the outbound phase, involving green logistics, would intuitively be expected to lead to competitiveness, but again, whether it would render improved financial performance needs to be investigated.

2.6. Implementation of GSCM

There is increase of consciousness among government, customers and multinational companies in enhancing the environment and acts as a driver for manufacturers to focus on greening their business. GSCM focuses on the environmental issue in both the upstream and downstream of the Supply Chain Management Shipeg and Linna (2011). GSCM aim is to preserve our resources and surrounding environments to prevent lives from deteriorating the creation and implementation practices using various resources which are reduce, reuse, rework, recycle, remanufacture, reverse logistics, refurbish, reclaim and more Dube and Gawand (2011). In

addition, Khushbu and Shah (2014) stated that GSCM is taking the environment consideration from product design, manufacture, sales, material choice and the entire manufacturing process and would be able to improve the products' international competitiveness, protect the environment and have continuous sustainable development within the firm. Furthermore Younis (2016) stated that the implementation of GSCM differs from organizations, type of the industry and the firm's position in the supply chain. On the top theses, Vachon (2008) stated that implementing GSCM properly is able to increase company's performance. To increase environmental flexibility and to maintain distribution flows from upstream to downstream, implementing GSCM is one of the solution and has role to reduce environmental damage through lifecycle concept by, green design , green procurement, green manufacturing, green distribution and reverse logistics,

2.7. Activities in Green Supply Chain Management

Most companies follow the following basic activities while applying green supply chain management.

Green procurement

Ninlawan *et al.* (2010) defined the Green procurement is an environmental purchasing consisting of involvement in activities that include the reduction, reuse and recycling of materials in the process of purchasing. Jugannath *et al.* (2018) further moreover explained that green procurement also the approach that consider the ecological and social outcomes with equivalent to the cost and quality of the procured resources as well it helps to maximize the resource efficiency .

Green Design

Jugannath *et al.* (2018) argued that Green design or ecological design it is away that designing the best mechanism in order to assuring the concept of ecological sustainability. Srivastava (2007) also explained that while designing companies have to consider the complete life cycle process of the product, the quantity, quality and price of the product in order to achieve least input resources and high environmentally compatible produces. Allen and Chia (2015) further

argued that to have market competitive advantage at international level companies strongly addressing environmental issue as their product development. Consequently, they may reduce the environmental impact of their products; reduce costs and increasing product marketability. In addition to these Wibowo, Handayani and Hustikasari (2018) stated that green design is the most important stage; it will determine significant effect on the life cycle environment of the project system.

Green Manufacturing

According to Mafini and Loury (2018), green manufacturing refers to the ability of business to adopt green strategies and techniques designed to reduce the negative effect of production processes on the ecosystem. It is also importance manufacturing companies involve their production strategies to be more environmentally oriented by including the proper recycling of waste, efficient disposal of hazardous products and protection of the labor force, moreover creating conclusive working environment.

Reverse Logistics

Jugannath *et al*. (2018) explained that reverse logistics has many dimensions. It can be consumer return, marketing returns, asset returns, damage returns, and many other types. However a good reverse logistics management may reduce risk and ensuring the companies has long-term relationship with its consumers.

Green Distribution

Green distribution is consisting of green packaging and green logistics. Packaging characteristics such as shape, size and material have an impact on distribution because of their effect on the transport characteristic of the product.

Green Packaging

Raagul .S and Jawagar S. (2016) explained that better packaging along with rearranged loading , patterns, can reduce material usage , increase space utilization in the warehouse and during transportation and the amount of handing required

2.8. Strategies of GSCM

Meythi and Riki (2013) have stated that companies require a strategy to implement GSCM. As the result they can gain competitive advantage. This competitive advantage means that there is a substantial interest amongst the companies to take action and decrease their environmental impact. In addition to this companies agreed that in order to stay in the competitive they have to consider the external stakeholders require forwards sustainability. Thus greening or GSCM is a potential source of competitive advantage so that companies need for investigative how environmental sustainability can be integrated to create a competitive production system.

Simpson and Samson (2008) explained and proposed four strategies, these are risk-based strategies, efficient-based strategy, and innovation- based strategy and closed-loop strategy. W.Adelina and R.D Kusumastuti (2017) argued that classification of environmental-friendly supply chain strategies based on company behavior forwards environmental management, level of commitment to resource and level of complexity in the implementation.

Risk -based strategies

The simplest strategy of GSCM with regard to inter-organizational investment resource development is one of risk minimization. Firms adopting this strategy are proposed to do so in response to stakeholder requirements. Such a strategy is ideal for the organization that retains minimal internal environmental management resources or has only recently begun to consider the introduction of a supply chain greening program. It is based in minimal inter-organizational engagement. Such efforts might involve the inclusion of basic clauses in purchasing contracts for suppliers to meet all relevant regulatory requirements. Most frequently used with this approach is the cascading of an established international standard such as ISO 14001. king Lenox and Terlaak (2005).

Efficiency -based strategies

A more complex and developing strategy in recent years has been the ‘eco – efficiency’ or ‘lean and green’ approach to GSCM. This type of strategy derives environmental performance benefits for the supply chain beyond more regulatory compliance through the requirements for suppliers to meet operations based efficiency targets. Much of the environmental performance benefit arises from specific manufacturing practices that have been found to provide secondary

environmental performance benefits. The point of departure for the efficiency based strategy from the risk- based strategy is the availability of dual economic and environmental performance benefits to the supply chain and the requirement for higher levels of engagement between customers and suppliers. The efficiency based strategy ties environmental performance to operational processes in the supply chain, and this strategy allows the extension of performance requirement in to the supply chains that maximize economic performance and provide secondary environmental performance benefits through waste and resource use reductions. It requires more comprehensive and supply chain specific performance specifications than the simpler risk- based strategy. It also requires a higher level of involvement between supply chain partners arising from the use of more complex. Inter-firm performance requirements.

The strategy can provide a cost-reduction advantage to the supply chain and readily fits with pre-existing organizational goals of organization. But the efficiency based supply chain strategy does not allow for more knowledge – intensive environmental management activities such as product design, material substitution, or innovation. The efficiency – based strategy is considered technically weak but more socially complex than the risk- based strategy .Simpson and Samson (2008).

Innovation -based strategies

The innovation – based green supply chain management strategy is distinct from the efficient base approach because of its use of a supply chain environmental performance strategy that is more environmentally specific. Organizations are increasingly aware of the potential for narrow purchasing policies to in source components or services from suppliers that may be legally non-compliant with environmental regulations or who themselves procure goods in an environmentally irresponsible way. Some organizations have begun to guarantee more comprehensive product life cycle considerations for consumers of their products. Once a supply chain begins to consider specialized processes, technologies or complex performance standards for suppliers such as chemical avoidance, the level of knowledge exchange and relational investment begins to change. Moving from efficiency – based GSCM strategy to a greater level of innovation or integration of environmental performance in supply chain and product design requires specialized environmental resources. Lenox and King, (2004).

Closed -Loop strategies

Closed loop strategies are a more recent type of GSCM strategy and represent the most complex and collaborative form of this type of activity often referred to in its simplest form as "reverse logistics" closing the loop involves the capture and recovery of materials for either re-manufacture (high-level) or recycling (low value) . These materials can arise during production, as returned goods, post – use and at end of life. The closed loop strategy ties or integrates environmental performance to the whole supply chain. Close -loop Strategy requires high level of integration, coordination across partners and socially complex knowledge. This social complex collaboration relationship provide the basic foundation for a closed – loop supply chain strategy Simpson and Samson (2008).

2.9. Legal Framework of Environmental Protection in Ethiopia

Ethiopia has international and national responsibility to reduce environmental problems. To this effect, the FDRE constitution has embodied one of the third generation human right catalogue of which one reads as follows. Article (92:1) *"All persons have the right to a clean and healthy environment"* In line with the above stipulations, Article 91 of the FDRE Constitution clearly spelt out that the government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment; and that government and citizens have the duty to protect the environment. FDRE Constitution (1995)

The Ethiopian Water Resources Management Proclamation (No.197/2000) was issued in 2000 to ensure that the water resources of the country are protected and utilized for the highest social and economic benefits of the people of Ethiopia, to follow up and supervise that they are duly conserved, ensure that harmful effects of water are prevented, and that the management of water resources is carried out properly. The Proclamation provides that all water resources of the country are the common property of the Ethiopian people and the State. The Proclamation obliges the government to ensure and administer that the management of any water resource is put to the highest social and economic benefits of the Ethiopian people. Moreover, the Proclamation recognizes the right of water users to establish associations upon their own initiation or at the initiation of the relevant authorities of the government. In relation to this in 2007, sold waste management proclamation no.513/2007, was issued in order to enhance at all

levels capacities to prevent the possible adverse impacts while creating economically and socially beneficial assets out of solid waste and ensuring that measures are taken to prevent pollution arising from the mishandling of solid wastes.

In 2002, the Environmental Impact Assessment Proclamation (No.299/2002) was issued to provide the framework for environmental impact assessment (EIA) to predict and manage the environmental effects of a proposed development activity as a result of its design sitting, construction, operation, or of an ongoing one as a result of its modification or termination. An organ or a person that initiates a project is required to carry out EIA and submit an EIA study report that identify the possible adverse impacts of the project and the means for their prevention or mitigation.

Another law, the Environmental Pollution Control Proclamation (No.300/2002) was issued in 2002 to eliminate or, when not possible to mitigate pollution as an undesirable consequence of social and economic development activities. The Proclamation defines pollution as any condition which is hazardous or potentially hazardous to human health, safety, or welfare or to living things created by altering any physical, radioactive, thermal, chemical, biological or other property of any part of the environment in contravention of the Proclamation or any other relevant law. The Proclamation provides that the government shall formulate environmental standards that regulate, air quality, waste management, noise and soil management. More importantly, the Proclamation recognizes the right of any person, without the need to show any vested interest, to lodge a complaint at the Environmental Protection Authority or the relevant regional environmental agency against any other person for causing actual or potential damage to the environment. Getachehu (2012) explained that due to attention is given to the protection of the environment, the recognition and protection of environmental rights is expanded through global and regional treaties ratified by Ethiopia.

2. 10. ISO 14001 and Environmental Management System

Jean (1998) explained that ISO is the International Organization for Standardization. It was established in Geneva, Switzerland in 1946 to promote international trade by harmonizing standards. ISO has developed international voluntary consensus standards for manufacturing, communication, trade, and management systems. The standards are designed to help

manufacturing and service companies of any size, or in any industrial sector, develop a uniform set of environmental management elements that will help to achieve their own environmental goals. ISO 14001 is an environmental standard. It has greater acceptance and role for supply chain management in the organizational environmental practice. Sarkis (2002)

According to Nicole ,Inshik and Sarkis(2009) over the last decade environmental audits become alarmingly increased and it's important for organizations existence for instance in the last 10 years more than 88000 organizations word wide have certified their environmental management system (EMS) to ISO 14001 , the international EMS standards which requires external audits as condition of certification.

According to Nicole (2006) argued that achieving ISO 14001 certification requires significant commitment of resource and incurs the loss of certification the potential environmental benefit associated with reducing pollution can be enjoyed by society at large . Moreover organization that certify to ISO 14001 may be able to enhance their environmental image and confer external legitimacy. They also may be able to use ISO 14001 to increase their internal efficiencies and create competitive advantage opportunity and economic benefits.

2.11. Barriers of GSCM Implementation

K.mathiyazhan *et al.* (2013) explain that as customers are becoming more environmental conscious and Governments are making stricter environmental regulations, the industries are focused to cleaner production by implementing GSCM in their industries. But they are struggling to implement GSCM concept and literature survey has thrown light on various kinds of barriers that hinder of an organization from going green. Perron (2005) summarized that there are four barriers categories that impede the implementation of green initiative in the organizations such as attitudinal and perceptions barriers includes resistance of management to change and fear of failure, informational related barriers such as lack of awareness on environmental legislations , environmental impact of the operations in an organization, resource barriers like that of financial barriers and human resource barriers and technical barriers includes lack of new technologies, materials or lack of technical expertise.

2.11.1. Perception of company's Environmental Impact

Hillary (2004) explained that the internal attitude and perception of the employee is a barrier to implementation of Green Supply Chain Management. Sudath and Zhang (2012) argue that although internal and external barrier exist, the internal barriers are the greatest impediment to environmental management system (EMS) implementation. In relation to this, positive environmental attitudes have been found to be an important factor in the introduction of environmental initiatives in businesses. Perron (2005) also claim that negative corporate altitude towards environmental initiatives and an unfavorable company culture jeopardizes environmental management system implementation.

2.11.2. Organizational Barriers

Ojo *et al.* (2014) and Govindan et al, (2014) were mentioned that the commitment, guidance, support and leadership from the top management will significantly impact the success of the firm's environmental management practices. Akshee (2017) further explained that top management has to proactive in making the organization green. The importance of top management beliefs, actions, and decision has been discussed in many research works. Thus, lack of involvement of top management is a huge barrier for GSCM. With respect to this Kumar *et al.* (2011) argue that organizational barrier means difficulty of implementing fundamental change in the organization. This is especially true when there are changes in the core features of organization like organizational goals, forms of authority, core technology, operational strategy and market strategy. In addition to the management commitment and organizational culture, corporate social responsibility and recycle and reuse efforts are also included as the elements of organizational barrier Srivastava and Gaur (2015). Furthermore, Mudgal *et al.* (2010) stated that corporate social responsibility is part of the organizational commitment. As a result, if the company lack of corporate social responsibility it will be a significant barrier to the implementation of GSCM practices. Any success for green management practices relies on the maturing of the management leadership and commitment Pun (2006).

2.11.3. Technological Barriers

According to Kumar *et al.* (2011), technology is a kind of knowledge, an organization with rich experience in the application and adoption of related technologies will have higher ability in technological innovation. Innovation and technology incorporate the innovation into corporate culture, encouraging new ideas and processes and solutions by all the employees of the firms. Resistance of organizations to technology advancement adoption is the resistance to change. Govindan *et al* (2014) explain that technological barrier is the first barrier among other barrier category in the implementation of GSCM. It includes the lack of new technology processes, applications, resources and expertise, fear of failure, complexity of design of green supply chain management.

2.11.4. Financial Barriers

Govindan *et al* (2014) explain that financial resources are fundamental in allowing the implementation of many environmental practices and many other studies report this as a significant barrier. Asknee (2017), stated that financial is essential to support the infrastructure of any green practice. Deepak *et al* (2014) furthermore explain that financial barrier includes lack of financial, non availability of bank loans, high cost of hazardous waste disposal and high investments in green practices will hinder the implementation of GSCM.

2.11.5. Informational Barriers

Kumar *et al.* (2011) explain that informal linkage and improved communication help the organizations to adopt Green's practices. Training and education are the prime requirements for achieving successful implementation of GSCM in any organization. Management may encourage employees to learn green information. Asknee (2017), argue that lack awareness among employees due to employees view GSCM practices as unnecessary steps and they prefer the conventional Supply Chain Management practices. Therefore, negligence of employee training considered as a huge barrier of GSCM. Sarkis et *al.* (2014) further explained that if there is lack of knowledge and information on environmental impact, it will lead to reduce of implementation of GSCM. Companies also find difficulties in conveying environmental information and benefits to their stakeholders due to lack of knowledge of the green products and process.

2.12. Theoretical Perspective of GSCM

2.12.1. Stakeholder Theory

Freeman.R. *et al.* (2010) explain that for the past thirty year a group of scholars has developed the idea that a business has stakeholders that is there are groups and individuals who have a stake in the success or failure of a business. The theory has been developed to solve several specific problems, such as the problems of value creation and trade the problem of the ethics of capitalism and the problem of managerial mindset. Palovita and Luoma-aho, u (2010) further explain Stakeholder pressure drives business towards levels of sustainable performance beyond legal compliance, which is also the objective of corporate environmental management.

Stakeholder theory suggest that companies produce externalized that affect many parties which are both internal and external to the form externalizes often cause stakeholders to increase pressure on companies to reduce negative impacts and increase positive ones. Environmental externalities may be internalized through these stakeholder pressures within and between supply chain members Sarkis, Zhu and Kee.h (2010).

The supply chain as an entity also had a variety of stakeholders, even more so than individual enterprises with an expansion of these stakeholder groups particularly when environmental issues are introduced .Marisa *et al.* (2008).

2.12.2. Institutional Theory

Hassan Younis (2016), explain that institutional theory presented in the early 1980's by Dimaggio and Powell (1983), claiming that firms attempt to the surrounding environment by adhering to legitimacy rules and regulation from one side and through seeking social fitness from another side. These authors also claim that firm's behavior may be driven by a strong social force motivating the organization to go in a certain direction. Such a force can be any form of social driver including culture, law or regulations. However, Zhu and Sarkis (2007) found that the implementation of GSCM practices is not always motivated by efficiency but rather that businesses endeavor to achieve social legitimacy and business sustainability. Government

regulations can be one of the main institutional factors that driven businesses to implement green supply chain practices.

2.12.3. Resource Based Theory

The resource based view of the firm and links the firm's success with the better utilization of its internal assets. This includes both tangible, such as financial reserves, and physical assets, and intangible assets such as reputation, employee skills and knowledge and corporate culture. Werner felt (1984) challenged the earlier belief that the firm's success is only determined by its external environment and argued that the competitive advantage of any firm is embedded within its unique assets. The firm needs to properly and efficiently manage its capabilities to upscale its performance and outperform its competitors. From a tangible assets perspective, Russo and Fouts (1997), claim that a firm can outperform its competitor's environmental performance, if the deployment of new physical assets enhances internal processes in the use of resources and waste reduction. Shelby (2012) also claimed that resource can be tangible and intangible entities available to the firm to enable the production of a value adding product for the targeted market. Moreover, he identified seven key types of resources; physical, legal, Human, financial, relational, informational and organizational.

2.13. Empirical Literature Review

In India, Govindan et al. (2014) conducted the study on barriers for the GSCM implementation in the industries through identification of essential barriers for GSCM implementation. The study attempted 47 initial barriers under five barrier categories from literature and industrial discussion were examined. The study also used proposed analytical hierarchy process (AHP) and the results clearly showed that the technology barrier category is the leading barrier category. Lack of technology is the most important impediment during GSCM adoption .Outsourcing, financial concerns and knowledge barrier categories are the next priorities. Therefore, the study revealed that India industries still struggle to prioritize environmental performance improvements over economic performance. Similarly, most industries struggle for financial support for new environmental adoptions. Indian industries also have low awareness on sharing of environmental knowledge and updating environmental technologies. However, they are interested in improving environmental performance.

Eltayeb and Zailani (2009) also investigated on the implementation of GSCM and their research focuses on the implementation of GSCM initiatives in Malaysia. They found that green design is the most highly adopted GSC initiative followed by green purchasing and lastly reverse logistics. Their studies also reveal that the GSCM initiatives are generally classified into three major categories which are green purchasing, eco-design, and reverse logistics.

According to G.Kathiresan and S. Ragunathan (2016) on their exploration study of drivers for the adoption of Green supply chain management in small and medium sized tanneries of Northern Tamilanadu, India; they developed interpretive structural modeling (ISM) to bring out the contextual relationship between the selected or identified criteria that includes technical capabilities, external stakeholder cooperation, environmental performance, economic performance, internal management and regulatory requirement to implement the GSCM in Northen Tamilandu tanning industries. They also concluded that stakeholder's cooperation is the key criterion in implementation of green supply chain in tanneries.

According to Cherrafi and Elfezazi (2017), on their study of barriers analysis for implementing green supply chain in the case of Morocco. They identified eleven barriers to implement green supply chain in Morocco and interpretive structural modeling (ISM) shown that poor quality of human resources, limited use of information and communication technologies, low competition and market uncertainty as well as lack of collaboration and green initiative are identified as the dependent variables. Lack of organizational culture, lack of innovation and scientific research and lack of financing mechanism are identified as linkage variables. Lack of governance and government support, unawareness of Morocco consumers and weakness of the nongovernmental organizations, and lack of top management commitment are identified as driver variables. The removal of these barriers will help to implement Green supply chain in Morocco. Lack of governance and government support is coming at the bottom of the structural model. It means that it is most powerful barriers and removable of this barriers will remove maximum number of other barriers.

Orion M. (2015) conducted a thesis on assessment of green supply chain management strategy the case of Ethio- Leather industry PLC MIDROC Ethiopia, The main finding showed that green supply chain management practices are weak in the company and firms do not use GSCM as competitive weapon, In terms of relationship between GSCM practices and competitive

positioning, it was found that internal operation flexibility practice positively impacts on the competitive positioning of firm. Strategic supplier partnership, customers' relationship and information sharing were influential in increasing competitive positioning of firms.

Mignot D. (2017) also identified the main barriers for implementations of GSCM are high cost of waste disposal and lack of alternative technology. Lack of technology has also greatest impact in implementation of green supply chain management.

Zellalem T. (2015), conducted a thesis on Green Supply Chain Management Practices in Ethiopia Tannery industry , The main findings were majority of tanneries didn't have a separate units, well defined environment management system and manual, no safety package for the workers, and no strong relation among tanneries and pertinent government environment officers. Furthermore, most of the tanneries released waste such as chromium, salty, decomposable dry skin without salt, chromium and sulfide acid to nearby community and harming the society dangerously. No environmental audit has been made by the internal as well as external parties so far. Therefore, the effect of tanneries in meeting the interest of stakeholders is so weak. The study also confirmed that organizational commitment, green purchasing green marketing, and inventory recovery, eco-design, environmental practice that affect environmental, economics and operational performance. Furthermore the study identified that cost implication, lack of quality of Human resources, and resistance to technology advancement adoption, unawareness of customers, suppliers reluctant to change towards green supply chain management, and lack of government support policies mentioned as challenge of implementing green supply chain management.

2.14. Conceptual Framework

The main objective of the study will examine the relation between the main impediments to implement GSCM among tanneries companies in Addis Ababa. With reference to the literature review and the research problem, the conceptual framework has been developed. The stakeholder, Institutional and Resource based theories have been used as the basis in developing this research framework. It is measured using five dimensions which are company's lack of perception environmental impact, organizational barriers, technological barriers, financial barriers and informational barriers.

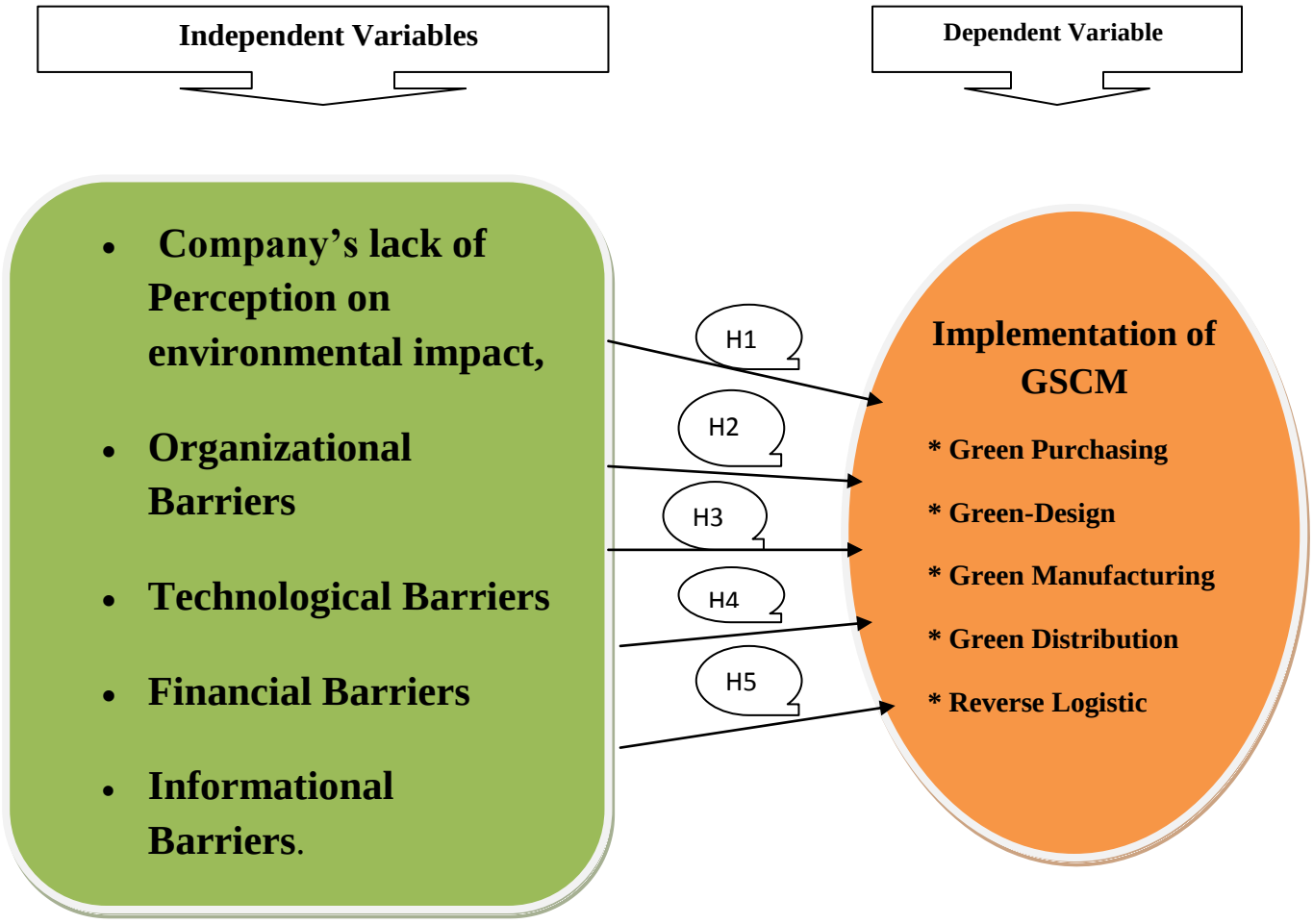


Fig.1. Model Adapted from Govindan et al. (2014)

2.15. Research Gap

Today firms are starting to realize that the global supply chains are exposed to varying level of environment regulations and compliance issues. There is therefore need to discuss the relevant environmental issues that are emerging developing green supply chain management. One series issue in tanneries is environmental pollution. However, during review of related literature, major impediments of green supply chain management are not boldly presented and discussed in view of green supply chain management. This study is helpful for tanneries to analyze the impediments of green supply chain management implementation and to find the key success; tanneries will also be able to improve their green supply chain management implementation by identifying the leading or dominant impediments.

2.16. Chapter Summary

This chapter summarized the review of past studies and identifies the five types of independent variables which are company's lack of perception on environmental impact, organizational barriers, technological barriers, financial barriers, and informational barriers that would affect the implementation of GSCM among Addis Ababa's tannery companies. The findings of past researchers are used to support the theoretical framework and hypothesis. The research gap also discussed. The details of the general idea of research methodology are review in the next chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

This part the research discusses the research design and methodology of the study. It describes the research approach, research design, study population size, methods of data collection, sources and instruments and methods of analysis employed to get answers for the research.

3.1. Description of the study area

The study area covered the tanneries companies in Addis Ababa, and the environmental concerned organizations which are directly related to the issues and the industries, such as Leather industry Development Institute (LIDI) and City Government of Addis Ababa Environmental Protection Authority

3.2. Research Approach

According to Creswell (2014), there are three types of research approaches these are quantitative, qualitative and mixed methods. Quantitative research is an approach for testing objective theories by examining the relationship among variables. These variables can be measured typically on instruments, so that numbered data can be analyzed using statistical procedures. On the other hand qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. Research in such situation is a function of researcher's insights and impressions. Mixed methods research is an approach to inquiry involving collection both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of mixed methods research is that the combinations of qualitative and quantitative approaches provide more complete understanding of research problems. Oral (2009) explanted that the issues of ontological and epistemological important while doing research in the area of green supply chain management; ontology guides what kind of knowledge need to be produced whereas epistemology deals with how such knowledge can be created . So he suggested that the research in GSCM should consider the interaction of the company with the environments and stakeholders. So that the researcher employed mixed methods research approach to have full picture about GSCM.

3.3. Research Design

This study aims to understand the strength of both the variable's relationship, to understand to what extent the five barriers will prevent the tannery companies from implementing GSCM. The study is also based on reviewing the previous researches and theoretical models to develop the five hypotheses. Furthermore, the research collected primary data by the distribution of questionnaires to test the existing theory and the developed hypothesis from the theoretical models. The concepts in the study were clearly defined and its emphasis to explain causal relationship between the barriers and green supply chain management .Hence, causal research design was used to investigate the impediments of GSCM implementation in Addis Ababa's tanneries.

3.4. Study Population / Research Participants

The study involved managerial and supervisory positioned employees of Addis Ababa tanneries and Director of Environmental Technology Directorate of Leather industry Development Institute (LIDI) and Deputy Manager of City Government of Addis Ababa Environmental Protection Authority.

3.5. Population Size

The population size determined based on data obtained from Leather industry Development Institute (LIDI) data bases. According to the result obtained there are 7(Seven) tanneries in Addis Ababa The respondents were those at positions of General Manager, Production Manager, Logistic/warehouse Manager, Facility/Fleet Manager, Sourcing Manager and Supervisors in charge of the operations of tanneries who also have an experience about the operation and management of supply chain. The researcher believed that these persons have enough knowledge to response the research questions concerning impediments of GSCM implementation in Addis Ababa tanneries. Thus, the total population for this study was 49 since 7 professional were taken as target population from each of 7 tanneries. The samples were selected deliberately by the researcher using purposive or judgmental sampling, this ensured professional judgment to select cases that would best enables to address the research questions and meet the research objective. Furthermore, the concerned and directly related to the tanneries Government organizations ;

Leather industry Development Institute (LIDI) and City Government of Addis Ababa Environmental Protection Authority, Director of Environmental Technology Directorate and Deputy Manager were interviewed respectively.

3.6. Method of Data Collection, Sources and Research Instruments

To address the research questions and draw meaningful research conclusion primary and secondary data were used. Primary data were collected through questionnaires and structured interview. Questionnaires were distributed to 7 tanneries and interview was conducted. Furthermore, secondary data were obtained from books, academic articles, website publications organizational reports, government documents, relevant proclamation, policies and procedures. As part of the research documents these used to gain insight about greening.

3.7. Method of Data Analysis

Descriptive and inferential statistics were used. Statistical package for Social Science (SPSS) version 20 software were used. According to Loeb et al. (2017), descriptive study is used not for descriptive purpose but also for determining the relationship between variables at the point of investigation, in causal research, descriptive analysis can create or contribute to the rational for understanding a study. Hence, in this study, descriptive statistics involved to summering and describing quantitative information in meaningful ways. In this regard frequency distribution, percentage, cumulative percentage, measures of central tendency (mean), mode, measures of variability (standard deviation) and Pearson correlation analysis were employed, Moreover, multiple regression analysis was used to test hypothesis with 95% confidence interval and narrative approach also used for condense raw textual data into a brief, summary format.

3.8. Validity and Reliability

Validity relates to whether findings of the subject matter studied are associated with current business practices. In other words, whether the measurements are measuring what they set out to assess. Since most of the questions were adapted from previous studies, disparities of business environments are part of the reason that some level of deficiency in regards to face validity exists.

Reliability is capability of research instrument in terms of measuring consistently. Cronbach's Alpha functions to determine internal consistencies of a test or scale. Alpha computed is referring to reliability of a test associated with other tests having identical quantity items and identical constructs that are measured. It is denoted in a value ranging from 0 to 1. Hair et al. (2014) suggested that a Cronbach's alpha value between 0.6 and 0.9 is acceptable. To improve the reliability of the finding different data source, data collection tools were used. Cronbach's alpha was test degree of consistency and the result .832 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.

3.9. Ethical Consideration

To assure the ethical issues in the research clear explanation were given to the tanneries companies and the relevant organizations regarding the purpose and implication of the study. Then, confidentiality and anonymity of the respondents are maintained.

3.10. Chapter Summary

Chapter three discussed about the methodologies adopted to conduct this research. Description of the study area, the research approach, research design, research participants, population size, method of data collection, source of data, and method of data analysis that applied in this study were outlined clearly in this chapter. The next chapter will be the detail data presentation, analysis and interpretation in which all data were obtained through methodologies specified in this chapter.

CHAPTER FOUR

DATA PRESENTATION, ANALYISIS AND INTERPRETATION

4.1. Introduction

This chapter shows the result of the study from 7 tanneries of Addis Ababa. The results are analyzed using SPSS software version 20. The result covers reliability analysis, demographic profile of respondents, analysis of finings, correlation analysis, multiple regressions analysis, multicollinearity and the summary of hypothesis testing. Furthermore, the study was conducted through the instrumentation of different data gathering tools (i.e. questionnaires and interview). Questionnaires were distributed to participants in person. From the total of 49 questionnaires distributed to the designated respondents only 42 were collected. From remaining 7 questionnaires: 5 were not returned at all, and 2 were not correctly filled. The returned questionnaire represented an eighty five point seven percent (85.7%) of response rate.

4.2. Reliability Test

Reliability analysis is conducted in this study to ensure that the measures of variables have internal consistency across the various items the same concept or variable. Reliability is measured in this study using Cronbach's alpha coefficients. According to Hair et al. (2014) suggested that a Cronbach's alpha value between 0.6 and 0.9 is acceptable.

Table 4.1 Reliability Statistics

Cronbach's Alpha	No. of Items
.832	33

Source: SPSS output

4.3. Demographic Profile of Respondents

This section provide the analysis of the respondents demographic profile which includes, gender, age group, education level , occupational status, year of service, the validity of EMS system and EMS certification using the one-way frequencies analysis.

4.3.1. Gender

Table4.2. Illustrates gender information of the respondents. The majority of the respondents in this study are male, where they made up 83.3 % of the total respondents. Meanwhile, the remaining 16.7 % of the target respondents are female. This implies that most of top and middle managers are male in Addis Ababa tannery companies.

Table 4.2. Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	35	83.3	83.3	83.3
	Female	7	16.7	16.7	100.0
	Total	42	100.0	100.0	

Source: SPSS output

4.3.2. Age group

Table 4.3 is the age demographic of the respondents, 2.4% of the respondents are from age 18-25 years old, 36.6 % of age 26-35 years old, 39 % of the age 36-45 years old, 9.8% of 46-55 years old and 12.2 % are above 55 years old.

Table 4.3. Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	1	2.4	2.4	2.4
	26-35	15	35.7	36.6	39.0
	36-45	16	38.1	39.0	78.0
	46-55	4	9.5	9.8	87.8
	Above 55	5	11.9	12.2	100.0
	Total	41	97.6	100.0	
Missing	System	1	2.4		
Total		42	100.0		

Source: SPSS output

4.3.3. Level of Education

As portrayed in table 4.4. 2.6 % of the respondents are secondary level, 12.8 % of the respondents hold diploma, 71.8 % who hold undergraduate degree, and only 12.8% owns a master degree. This indicates that most of the managers are educated.

Table 4.4. Level of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary Education	1	2.4	2.6	2.6
	College Diploma	5	11.9	12.8	15.4
	Undergraduate Degree	28	66.7	71.8	87.2
	Master Degree	5	11.9	12.8	100.0
	Total	39	92.9	100.0	
Missing	System	3	7.1		
Total		42	100.0		

Source: SPSS output

4.3.4. Occupational Status

As seen from the table 4.5 from the total respondents 5% of the General Managers, followed by 17.5% Facility/Fleet managers, 22.5% of Logistic/Warehouse Managers,10% Sourcing Managers , 20 % Production Managers and 25% officers and above, This result portrays that the most respondents are of managerial levels.

Table 4.5. Occupation Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	General Manager	2	4.8	5.0	5.0
	Facility/Fleet Manager	7	16.7	17.5	22.5
	Logistic/ warehouse Manager	9	21.4	22.5	45.0
	Sourcing Manager	4	9.5	10.0	55.0
	Production Manager	8	19.0	20.0	75.0
	Officer and above	10	23.8	25.0	100.0
	Total	40	95.2	100.0	
Missing	System	2	4.8		
Total		42	100.0		

Source: SPSS output

4.3.5. Service Duration

Table 4.6 shows the distribution of the service duration of the respondents , 19% that works for1year to less than 3 years, 11.9 % that works from 3 years to less than 4 years ,and the largest percentage is 69 % that woks for 5 years to less than 10 years. This implies that tanneries top and middle managers have enough work experience.

Table 4.6.Service Duration

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 year to less than 3 years	8	19.0	19.0	19.0
	3 years to less than 4 years	5	11.9	11.9	31.0
	5 years to less than 10 years	29	69.0	69.0	100.0
	Total	42	100.0	100.0	

Source: SPSS output

4.4. Environmental Management System (EMS)

Table4.7. shows distribution of the tannery companies' that have environmental management system in their companies. 76.2 % of the companies that have EMS, 16.7 % of the companies that do not have an EMS in placed and 7.1 % are implementing in process.

Table 4.7. Environmental Management System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	EMS	32	76.2	76.2	76.2
	None- EMS	7	16.7	16.7	92.9
	In progress	3	7.1	7.1	100.0
	Total	42	100.0	100.0	

Source: SPSS output

As stated in the literature environmental audits become alarmingly increased and it's important for the organization existence. The international Environmental Management System (EMS) standards required external audits as condition of certification.

4.5. Environment Certification

Table 4.8 shows the distribution of the tanneries' that have environmental certification in placed in their companies. 54.8% of the companies that have ISO 14001 environmental certification and 45.2 % that do not have.

4.8.Environmental Certification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ISO 14001	23	54.8	54.8	54.8
	None	19	45.2	45.2	100.0
	Total	42	100.0	100.0	

Source: SPSS output

As stated in the literature ISO 14001is an environmental standard. It has greater acceptance and role for supply chain management in the organization, environmental practice. Sarkis (2002)

4.6. Analysis of the Findings

The use of frequency analysis would be able to generate frequency tables and charts, in which information pertaining to the frequencies of phenomena occurrence and variability of the set is provided. Furthermore, the mean of sample distribution is able to obtain from the frequency analysis performed.

Table4.9. Questions Related to Company's lack of Perception on Environmental Impact

No.	Questions	N	Mean	Mode	Standard Deviation	Grand Mean
1	Company's lack of Perception on Environmental Impact of Waste Generation	42	2.95	2	1.287	3.36
2	Company's lack of Perception on Environmental Impact of Air Pollution	42	3.36	4	1.206	
3	Company's lack of Perception on Environmental Impact of Waste Pollution	42	3.00	2	1.189	
4	Company's lack of Perception on Environmental Impact of Deposits to land	41	3.51	4	.952	
5	Company's lack of Perception on Environmental Impact of	42	3.33	4	1.262	
6	Company's lack of Perception on Environmental Impact of Noise pollution	42	3.57	4	1.29	
7	Company's lack of Perception on Environmental Impact of Heat (Visual) light pollution	39	3.85	4	1.182	

Source: SPSS output

The information was asked to give their response on company's perception to environmental impact using five likert scales. The range was 'very low impact' (5) to 'very high impact (1).From table above the mean value for all questions related to this variable falls within the range 2.95 to 3.85. The results of this study showed that Addis Ababa tanneries mean score of company's perception on waste generation, air pollution, water pollution, deposit to land, health and safety hazards, noise pollution, and heat/visual/light pollution are 2.95,3.36,3.00,3.51,3.33, 3.57,and 3.85 respectively. And the grand mean is 3.36 as well. From the mean value the result

showed that tanneries lack of perception to environment impact contribute to hinder implementation of GSCM. The mode score for the majority of the questions related to company's lack of perception on environmental impact in this study is 4. The findings of this study indicate that the majority of the target respondents have chosen "Agree" to all the questions related to their perception of environmental impact. As stated in the literature, low internal attitude and perception of the employees towards environmental impact is a barrier to implementation of Green Supply Chain Management.

Table4.10. Questions Related to Organizational Barriers

No	Questions	N	Mean	Mode	Standard Deviation	Grand Mean
1	The top management commitment in implementation of Green supply Chain management is low	42	2.86	2	1.354	2.69
2	The middle management commitment in implementation of Green supply Chain management is low	42	2.67	2	1.223	
3	The company is less concern on corporate social responsibility	42	2.36	1	1.284	
4	The company's culture hinders the implementation of Green supply Chain Management	41	2.76	2	1.067	
5	The company is less concern on recycling and reuse of forts throughout the supply chain	41	2.80	2	1.229	

Table 4.10 shows the summary of central tendency for the variable organizational barriers. The mean score of the top and middle management commitment, company concern on corporate social management, company's culture and company's concern on recycling and reuse of waste towards implementation of Green Supply Chain Management,2.86,2.67,2.36,276,and 2.80 respectively as well as their grand mean 2.69.This figure implies that there is lack of organizational commitment. As stated in the literature of this study the commitment from the top management will significant impact on the success of the company's Green Supply Chain Management implementation .In addition, in the current market companies feel socially and environmentally responsible and engage in corporate social responsibility. Moreover from the interview response obtained that, Addis Ababa tanneries have problems of solid waste generation

and liquid waste. In addition to these tanneries have been engaged constructing the treatment plant for the liquid waste , however for solid waste for the time being there is inadequate recycling plant or reuse mechanism .

Table4.11. Questions Related to Technological Barriers

No	Questions	N	Mean	Mode	Standard Deviation	Grand Mean
1	The company lacks of IT application to implement Green Supply Chain Management	42	3.71	4	1.066	3.27
2	The company is resistant in implementing advance technology for GSCM	42	3.17	4	1.167	
3	There is a high fear of failure if company implements GSCM	42	2.95	2	1.168	
4	The company lack of technical expertise in field of GSCM	41	3.29	4	1.188	
5	There is complexity of design/ structure to implement GSCM	42	3.21	4	1.048	

Source: SPSS output

The result of this study showed that the mean score of lack of IT, company's resistance, high fear of failure, lack of technical expertise and complexity of design/ structure to implement green supply chain management, 3.71, 3.17, 2.95, 3.29, and 3.21 respectively and the grand mean for technological barriers is 3.27. From the mean value the result showed that company lacks of IT application, lack of technical expertise in field of GSCM, complexity of design/ structure to implement GSCM, and resistant in implementing advance technology have the highest technological barriers while the lowest barrier is fear of failure. The mode score for majority of the questions related to technological barrier in this study is 4. The findings of this study indicate that the majority of the target respondents have chosen "Agree" to all the questions related to technological barriers. As stated in literature and empirical review resistance of organizations to technology advancement adoption is the resistance to change. Mignot (2017) also identified that lack of technology has greatest impact in implementation of green supply chain management.

Table4.12. Questions Related to Financial Barriers

No	Questions	N	Mean	Mode	Standard Deviation	Grand Mean
1	It is overall costly to implement Green supply Chain Management for the company	42	3.40	4	1.127	3.54
2	There is limited (restricted) availability of bank loans to encourage Green supply Chain Management	42	3.64	4	.906	
3	The cost is higher for waste treatment than proper disposal	41	3.85	4	.853	
4	The training cost is high if the company implements GSCM	42	3.36	4	1.008	
5	It is more costly to purchase environmental friendly materials	41	3.71	4	.873	
6.	The cost of financing Green supply Chain Certification such as ISO 14001 is high.	42	3.29	4	.918	

Source: SPSS output

This section sought to provide a description of the financial barriers. Mean score for overall cost ,limited availability of bank loan, higher cost of waste treatment, high cost of training, the more cost of purchase of environmental friendly materials and high financing cost of green supply chain certification to implement the GSCM , 3.40,3.64,3.85,3.36,3.71, and 3.29 respectively. The grand mean for financial barrier is 3.54.From the mean value, the result showed that the highest cost for treatment plant, cost for purchasing environmental friendly materials, restriction of bank loan, overall cost to implementation of GSCM, and the cost of financing contribute to hinder the GSCM implementation in Addis Ababa tanneries. Moreover, the mode score for the majority of the questions related to financial barriers in this study is 4. The findings of this study indicate that the majority of the target respondents have chosen “Agree” to all the questions related to financial barriers. Govindan et al., (2014) on their part stated that financial resources are fundamental in allowing the implementation of many environmental practices and Asknee (2017) also stated that financial is essential to support the infrastructure of any green practice.

Table4.13. Questions Related to Informational Barriers

No	Questions	N	Mean	Mode	Standard Deviation	Grand Mean
1	The company does not have sufficient knowledge in green practices.	42	2.55	2	.993	2.48
2	Our customers are less aware of Green supply Chain management.	42	2.69	2	1.115	
3	Our supplier are less aware or concern about Green supply Chain Management	42	2.67	2	1.183	
4	The company does not have sufficient knowledge in reverse logistics adoption.	42	2.71	2	.918	
5	The company does not have sufficient knowledge in environmental impact.	42	1.79	2	.782	

Source: SPSS output

Table 4.13 shows informational barriers, that the mean score of the company's knowledge in green practices, awareness of customer and supplier towards green supply chain management, the company's knowledge in reverse logistics adoption and company's knowledge in environmental impact are 2.55, 2.69, 2.67, 2.71, and 1.79 respectively. The grand mean for informational barriers is 2.48. From the mean and mode values, the finding show that most of Addis Ababa's tannery companies and their customers and suppliers are aware about green practices and reverse logistics improve GSCM implementation. Thus, tanneries believe that informational barriers impede the implementation of GSCM through the knowledge on green practices, reverse logistics adoption, and on environmental impact and their customers and suppliers .Luthra et al,(2011) they stated that training and education are the prime requirements for achieving successful implementation of green supply chain management in any organization.

Table4.14. Questions Related to Impediments and Implementation of GSCM

No	Questions	N	Mean	Mode	Standard Deviation	Grand Mean
1	There is low Company's perception on environmental impact and GSCM. Implementation is low.	42	3.36	2	.975	2.92
2	There exist lot of organizational barriers and GSCM implementation is low	42	2.67	4	1.091	
3	There exist lot of Technological barriers and GSCM implementation is low	42	3.27	4	.827	
4	There is inadequate Financial resource and GSCM implementation is low	42	3.54	2	.668	
5	There exist lot of Informational barriers and GSCM implementation is low	42	2.48	4	.74	

Source: SPSS output

The result of this study showed that the mean score of low Company's perception on environmental impact, lot of organizational barriers, lot of Technological barriers ,inadequate financial resource, and lot of Informational barriers that cause low green supply chain management, 3.36,2.67,3.27,3.54,and 2.48 respectively. The grand mean for impediments in implementation of GSCM is 2.92.From the mean value, we could conclude that the inadequate financial resource, company's lack of perception on environmental impact and technological barriers contributes to impede the implementation of GSCM. The modes score for the majority questions related to organizational, technological and financial barriers in this study is 4. The finding of this study indicates that the majority of target respondents have chosen "Agree'' to all the questions related to GSCM implementation. As stated in the literature, Zellalem (2015) stated that the effect of tanneries in meeting the interest of stakeholder is so weak. Moreover, organizational commitment, green purchasing, green marketing and inventory recovery, eco-design, lack of Human resource, resistance to technology advancement adoption, unawareness of customers, supplier reluctant change towards GSCM and lack of government support policies mentioned as challenges for implementing green supply chain management.

4.7. Reliability Analysis

Cronbach's alpha reliability test was used to check for the internal consistency of the data. The closer the Cronbach's alpha value to 1 is the higher is the internal consistency reliability. Table 4.15 explains the ranges of the reliability coefficient, from .7 to .926. The highest reliability coefficients were the company's lack of perception on environmental impact (.926), followed organizational barriers (.925), financial barriers (.792), informational barriers (.788), technological barriers (.787) and lastly is impediments and implementation of GSCM (.7). All the Cronbach's alpha values are above than .6 therefore the data of this study is reliable.

Table 4.15. Reliability Test Result

No.	Construct Name	Cronbach's alpha
1.	Company's lack of perception on environmental impact	.926
2.	Organizational Barriers	.925
3.	Technological Barriers	.787
4.	Financial Barriers	.792
5.	Informational Barriers	.788
6.	Implementation of GSCM	.7

Source: Developed for the research

4.8. Correlation Analysis

By using the Pearson correlation coefficient, the survey identified the existence of relationship between impediments of GSCM dimensions and the implementation of GSCM dimension the causality of these independent and dependent variable was at 95% confidence level. Therefore, this correlation analysis helped to determine whether statistically significant relationships exist between the barriers of GSCM (i.e. Company's lack of perception on environmental impact, technological, organizational, financial and informational barriers) and GSCM implementation. As well as the direction of relationship,(i.e. positive or negative) relation.

Bluman (2009), stated that, the coefficient of correlation could take values ranging from 1 to +1, where the sign signifying the direction of relationship. Correlation value of 0 implies the absence of relationship among variable result between 0.1and 0.3 weak relationship, where a result between 0.4 and 0.6 ,0.7 and 0.9 imply respectively moderate and strong relationship among variable while correlation coefficient of 1 suggest perfect relationship.

Therefore, based on the above mentioned parameters the tables embedded below revealed that there is negative relationship between the dimension of impediment of GSCM and implementation of GSCM .As we can simply inter the table below revealed that there is negative relation between the impediments and implementation of GSCM.

Ranging from the strongest correlation between impediments of GSCM implementation of GSCM with correlation coefficient (r=-.509 p=.001), (r=-.722, p=.000), (r=-.712, p=.000), (r= -.333, p=.031) and (r=-.648, p=.000), company's lack of perception on environmental impact, organizational, technological, financial and informational, barriers respectively. Except in case of financial barrier, (95% confidence level), all the relationship are statistically significant at 99% confidence level.

Table4.16. Correlation between impediments of GSCM and implementation of GSCM.

		Implementation of GSCM
Company's lack of perception on environmental impact	Pearson Correlation	**-.509**
	Sig. (2-tailed)	**.001**
	N	**42**
Organizational barriers	Pearson Correlation	**-.758**
	Sig. (2-tailed)	**.000**
	N	**42**
Technological barriers	Pearson Correlation	**-.712**
	Sig. (2-tailed)	**.000**
	N	**42**
Financial barriers	Pearson Correlation	**-.374**
	Sig. (2-tailed)	**.031**
	N	**42**
Informational barriers	Pearson Correlation	**-.648**
	Sig. (2-tailed)	**.000**
	N	**42**

Source: SPSS output

4.9. Regression Analysis

According to Bluman (2009), the purpose of the regression line is to enable the researcher to see the trend and make prediction on the basis of the data. However, the value of correlation coefficient is significant. Therefore via the instrumentalism of multiple linear regressions analysis effort was made to determine the prediction power of the independent variables..

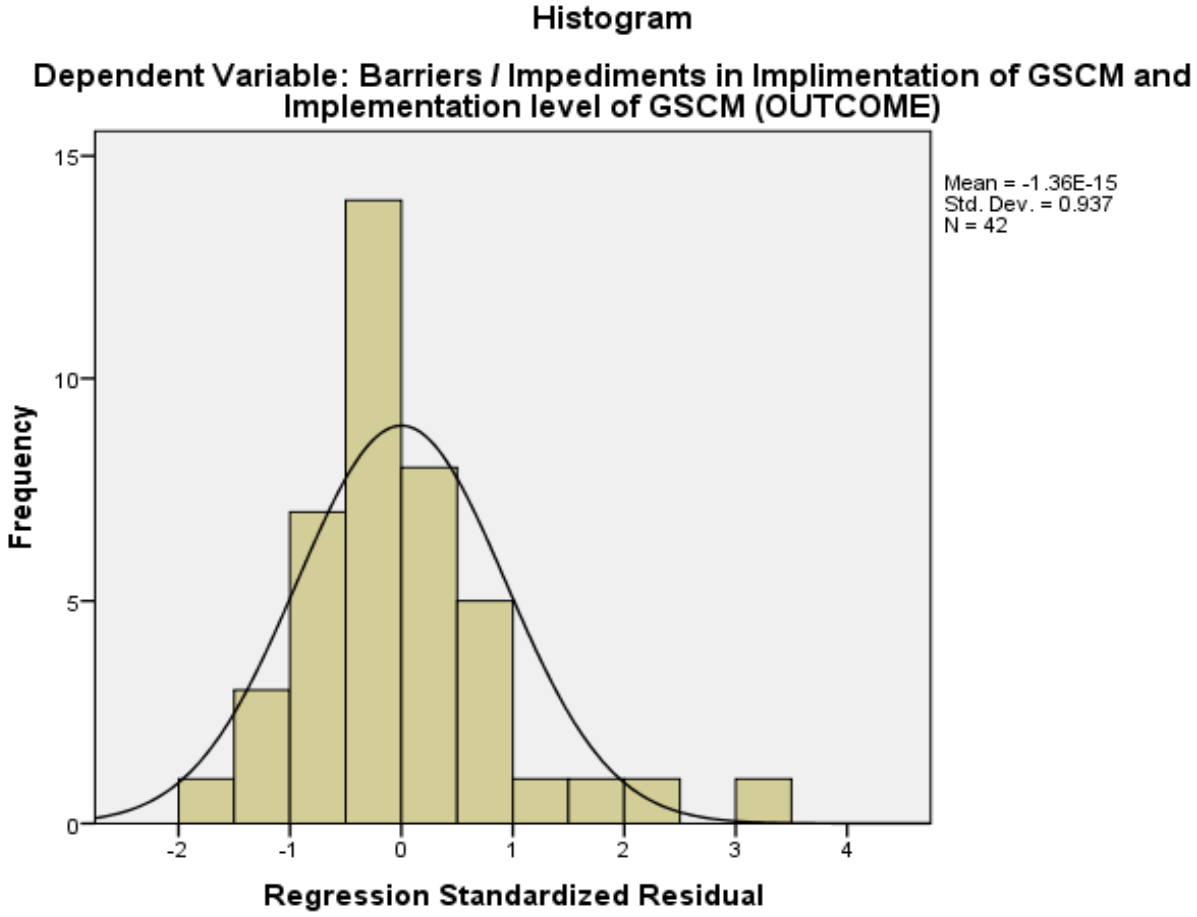
4.9.1. Test for Regression Model Assumptions

Regression analysis is sensitive to different factors. The following factors/assumptions should be checked before the regression analysis is made. The main assumptions of regression tests are normality, linearity, test of homogeneity of the variance and absence of multicollinearity and checking for outliers.

4.9.1.1. Test of Normality

This is done in two ways: the histogram and the normal probability plot. The best way to check how far the data used are from a normal distribution is, to look at a graph/histogram with a straight line along the diagonal, and then normality can be assumed. If the overall distribution deviates from a bell-shaped normal distribution it violates the assumption. As we can see from the histogram below; the residuals are seamlessly normally distributed. Therefore, in this survey result the assumption of normality is not violated.

Fig.4.1. Test of Normality

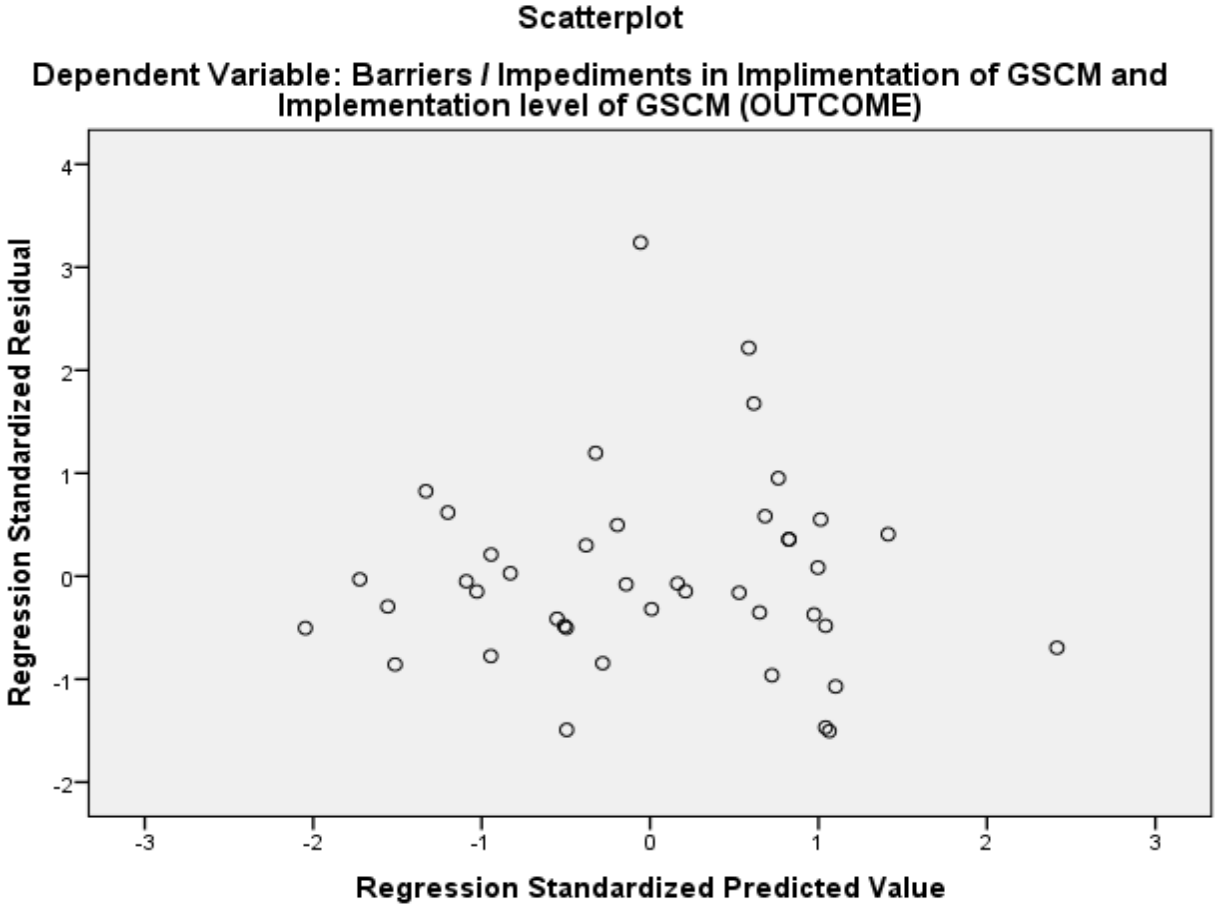


Source: SPSS Output

4.9.1.2. Test of Homogeneity of the variance/ Homoscedasticity

Homoscedasticity assumption elaborates that the variance of the residuals about the predicted dependent variables scores should be the same for all predicted scores. Error variance is assumed to be the same across all values of other variable. To assess Homoscedasticity, the scatter plot of standardized residuals verses standardized predicted values can be created. If the plot shows random scatter, the assumption is met. However, if the scatter has a cone shape, then the assumption is not met.

Fig.4.2. Test of Homogeneity of the variance

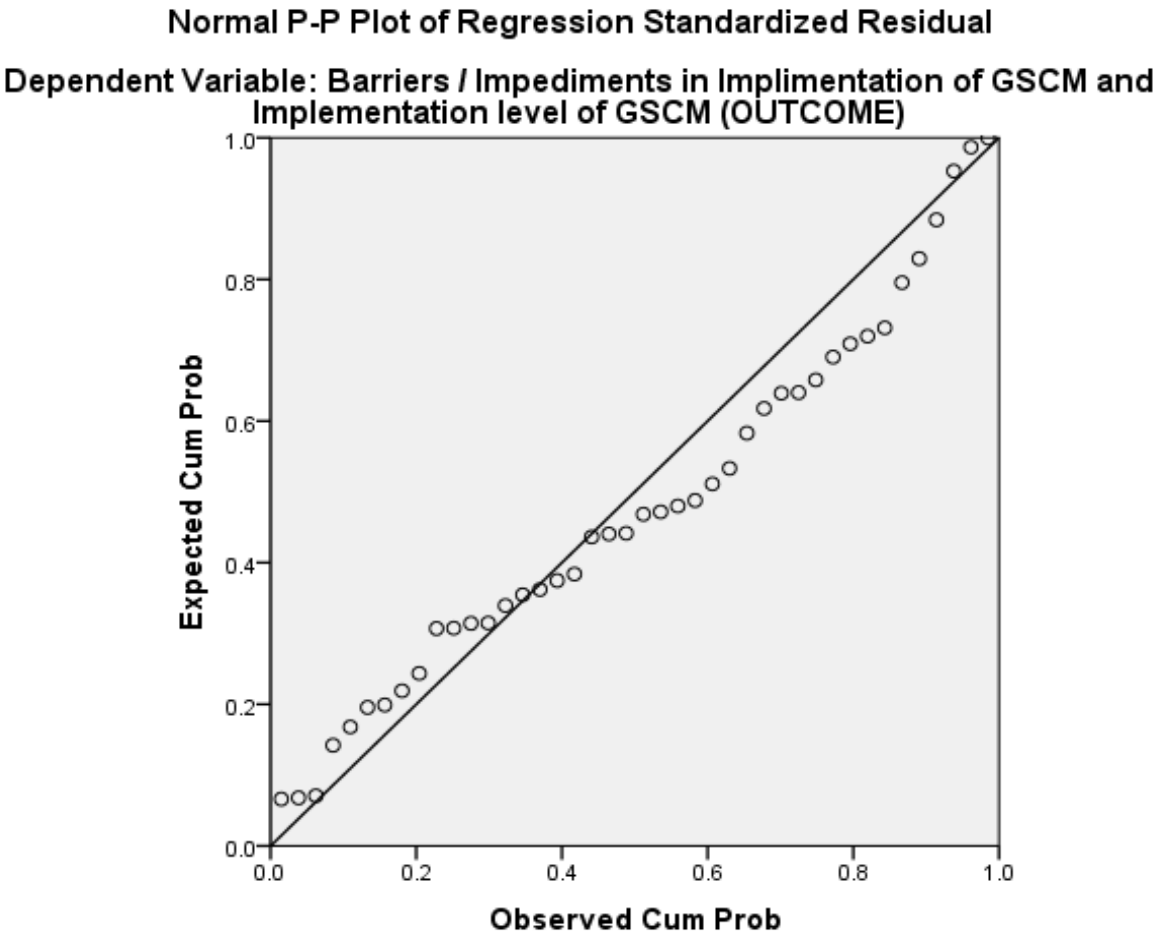


Source: SPSS output

4.9.1.3. Test for Linearity

In regression analysis the assumption of linearity is to be tested. In this case the relationship between the dependent variable and each independent variable should be linear. This is checked and presented is in the figure 4.3.below.

Fig.4.3. Test for Linearity



Source: SPSS Output

4.9.1.4. Multicollinearity Analysis

In order to identify whether some of the independent variable have very high correlations with other independent variables, using collinearity diagnostics, multicollinearity estimate was performed. Yoo et al., (2014) stated that multicollinearity increases, it is more difficult to ascertain the effect of any single variable produce biased estimates of coefficients for regressor because the variables have more interrelationships.

Tolerance value is an indication of the percentage of variance in the predictor that cannot be accounted for by the other predictors implying the fact that very small values indicate overlap or

sharing of predicative power. Moreover, if the VIF (variance inflation factors) values of independence variables are beyond 10, then it is suggested that further investigation is required Yoo *et al.* (2014)

Table 4.17 Multicollinearity test result

Model	Collinearity statistics	
	Tolerance	VIF
Company's lack of perception on environmental impact	.832	1.202
Organizational barrier	.400	2.501
Technological barrier	.476	2.101
Financial barrier	.826	1.211
Informational barrier	.610	1.639

Source: SPSS out put

Therefore the multicollinearity test result of this particular study as it was presented on table 4.16 revealed that the tolerance values for all the independent variables are with the acceptable level of greater than 0.2 while the VIF values are also less than the threshold of value of 10.

In this regard it is possible to agree that multicollinearity is not serious problem as long as this particular test result is concerned.

4.9.1.5. Test for Outlier detection

Outliers can be identified by standardizing the scores and checking the standardized scores for absolute values. Such values may be considered outliers and may need to be removed from the data. Since the distribution of the data is the normal, the data score value range of scatter plot is in between -3 and 3; we can conclude that there is no outlier which needs to be removed.

4.9.2 Multiple Regression Analysis Result

In multiple linear regressions analysis of such sort ANOVA test shows the acceptability of the model from statistical perspective. Accordingly, the regression row indicate the extent of variation explained by the model, whereas the residual row indicates information about the variation that is not accounted for the model, that is variation on the dependent variable explained by factors not included on the model.

Table 4.18 ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	17.042	5	3.408	20.749	.000[b]
	Residual	5.914	36	.164		
	Total	22.956	41			

Source: SPSS output

a. Dependent Variable: Barriers / Impediments in Implementation of GSCM and Implementation level of GSCM (OUTCOME)

b. Predictors: (Constant), Information Barriers, Financial Barriers, Company's Lack of Perception on Environmental Impact of GSCM implementation, Technological Barriers, Organizational Barriers

As shown in the above table the ANOVA test results demonstrated that the models are acceptable from statistical perspective. in other word 0.000 level of significance are obtained in all cases (i.e. company's lack of perception on environmental impact of GSCM implementation ,technological barrier , organizational barrier, financial barrier ,informational barrier and implementation of GSCM); This statistical condition further revealed that the regression model are statistically appropriate to the data.

The computed F statistics is 20.749 with an observed significance level of .000 implying that statistically fitness of the regression model to the data.

Table 4.19 Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.862[a]	.742	.707	.40531

Source: SPSS output

a. Predictors: (Constant), Information Barriers, Financial Barriers, Company's Lack of Perception on Environmental Impact of GSCM implementation, Technological Barriers, Organizational Barriers

b. Dependent Variable: Barriers / Impediments in Implementation of GSCM and Implementation level of GSCM (OUTCOME)

As shown in the above model summary table the adjusted R square is .707, this suggest that 70.7% of the variation in the model is explained by the variables already incorporated into the model. Therefore in this particular case 0.707 R square values revealed that 70.7 % of the variation in the implementation of GSCM explained by the variables existed in the model. This furthers that only 29.3% of the variation in the dependent variable is to be determined by the variable outside of the model.

Table4.20. Multiple Regression Analysis between Implementation and Impediments of GSCM

Model Summary		R		R^2	Adjusted R^2	Std. Error of Estimate
		.862		.742	.707	.40531
Model		Unstandardized Coefficient		Standardized Coefficients	t	Sig
		B	Std. Error	**B**eta		
Coefficients	Constant	5.809	.418		13.885	.000
	Company's lack of perception on the environmental impact.	-.167	.071	-.218	-2.352	.024
	Organizational Barriers	-.225	.092	-.328	-2.454	.019
	Technological Barriers	-.234	.111	-.268	-2.188	.035
	Financial Barriers	-.083	.104	-.074	-.794	.433
	Informational Barriers	-.256	.109	-.253	-2.340	.025

a. Dependent variable: Barriers/ impediments in implementation of GSCM and implementation level of GSCM(OUTCOME)

b. Predictors: (Constant), Information Barriers, Financial Barriers, Company's Lack of Perception on Environmental Impact of GSCM implementation, Technological Barriers, Organizational Barriers.

Source: SPSS output significant level P< 0.05

With reference to the above coefficient table revealed that Company's lack of perception on environmental impact, organizational, technological, and informational barriers are statistically significant (at P<.05) and their standardized coefficient beta (β) values -.218, -.328, -.268, and -.253 respectively. Similar to the result found in the course of the correlation analysis, the direction of the relationship is negative this implies that the above independent variables adversely affect the implementation of the green supply chain management. Therefore, as clearly depicted on the table, along with the predictive power of the dimension, the major impediments that hinder the implementation of GSCM in Addis Ababa tanneries, were followed by organizational barrier, technological barrier, informational barrier and Company's lacks

perception on the environmental impact. From the research findings, the following multiple regression model was developed;

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

$$Y= 5.809 - .218 X_1 - .328 X_2 - .268 X_3 - .253 X_5 + e$$

Where; Y- Implementation of GSCM

α – Constant (5.809)

X_1- Company's lack of perception on the environment impact

X_2- Organizational Barriers

X_3- Technological Barriers

X_4- Financial Barriers

X_5- Informational Barriers

e – Error term

The above model presents the linear relationship of the research variables. The coefficients implies that change in Company's lack of perception on the environment impact by one unit lead to change in implementation of GSCM by .218, change in organizational barriers decreases the implementation of GSCM by .328 and change technological barriers lead to impede the implementation of GSCM by .268 percent. Informational barriers lead to hinder implementation of Green Supply chain management by .253 percent. The financial barrier was not incorporated in the regression equation, due to its statistically insignificant at P – value of 0.433.

4.10. Testing Hypotheses (Chi-Square Test)

The correlation analysis shows tie between the independent variables and dependent variable. The constructs for each factor are aggregated using the mean score. As it is depicted in table 4.15 for most variables is above 0.33. This implies that there exist some degree of relationship between dependent and independent variables.

Hypothesis1. Company's lack of perception on environmental impact has no significant relationship with the implementation of green supply chain management.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	295.546[a]	273	.167
Likelihood Ratio	146.370	273	1.000
Linear-by-Linear Association	10.608	1	.001
N of Valid Cases	42		

Source: SPSS output

a. 308 cells (100.0%) have expected count less than 5. The minimum expected count is .02.

From the above table the chi square test result in the above indicate that the calculated chi-square value x=0.025 or p value is less than .167. Thus, the result rejects the null hypothesis. Therefore, there is relationship between company's lacks of perceptions on environmental impact with implementation of green supply chain management. As indicated in the literature, positive environmental attitudes have been found to be an important factor in the introduction of environmental initiatives in business.

Hypothesis 2: Organizational barrier has no significance relationship with the implementation of green supply chain management.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	201.437[a]	195	.361
Likelihood Ratio	127.583	195	1.000
Linear-by-Linear Association	23.539	1	.000
N of Valid Cases	42		

Source: SPSS output

a. 224 cells (100.0%) have expected count less than 5. The minimum expected count is .02.

From the above table the chi square test result in the above indicate that the calculated chi-square value x=0.02 or p value is less than .361. Thus, this result rejects the null hypothesis. Therefore, there is relationship between organization barriers with implementation of green supply chain management. As shown from literature and empirical studies, lack of involvement is huge barrier for green supply chain management.

Hypothesis 3: Technological barrier has no significant relationship with the implementation of green supply chain management

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	215.425[a]	182	.046
Likelihood Ratio	118.680	182	1.000
Linear-by-Linear Association	20.792	1	.000
N of Valid Cases	42		

Source: SPSS output

a. 210 cells (100.0%) have expected count less than 5. The minimum expected count is .02.

\

From the above table the chi square test result in the above indicate that the calculated chi-square value x=0.04 or p value is less than 0.046. Thus, this result rejects the null hypothesis. Therefore,

there is relationship between technological barriers with implementation of green supply chain management. As indicated from literature and empirical studies, resistance to technology advancement adoption and lack of alternative technology have greatest impact in implementation of green supply chain management.

Hypothesis 4: Financial barrier has no significant relationship with the implementation of green supply chain management.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	192.246[a]	195	.542
Likelihood Ratio	122.808	195	1.000
Linear-by-Linear Association	5.646	1	.017
N of Valid Cases	42		

Source: SPSS output

a. 224 cells (100.0%) have expected count less than 5. The minimum expected count is .02.

The chi- square test in the above table indicate that calculated chi-square value x=0.3 or p value is less than 0.542. Thus, this result rejects the null hypothesis. Therefore, there is relationship between financial barriers with implementation of green supply chain management. As stated in the literature and different empirical studies, financial is essential to support the infrastructure of any green practice.

Hypothesis 5: Informational barriers has no significant relationship with the implementation of green supply chain management

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	193.696[a]	182	.263
Likelihood Ratio	123.143	182	1.000
Linear-by-Linear Association	17.199	1	.000
N of Valid Cases	42		

Source: SPSS output

a. 210 cells (100.0%) have expected count less than 5. The minimum expected count is .02.

From the above table the chi square test result in the above indicate that the calculated chi-square value x=0.2 or p value is less than 0.263. Thus, this result rejects the null hypothesis. Therefore, there is relationship between informational barriers with implementation of green supply chain management. As stated in the literature; training and education are the prime requirements for achieving successful implementation of green supply chain management in any organization.

Table21. Summary of Hypothesis

No.	Hypothesis	Decision
Ho_1	Company's lacks Perception on environmental impact has no significant relationship with the implementation of green supply chain management	**Rejected**
Ho2	Organizational barrier has no significant relationship with the implementation of green supply chain management	**Rejected**
Ho3	Technological barrier has no significant relationship with the implementation of green supply chain management	**Rejected**
Ho4	Financial barrier has no significant relationship with the implementation of green supply chain management	**Rejected**
Ho5	Informational barrier has no significant relationship with implementation of green supply chain management	**Rejected**

4.11. Chapter Summary

This chapter studies the developed hypothesis and the result obtained is to accept the hypothesis and reject null hypothesis. This illustrates that all independent variables have significant relationship with the implementation of GSCM. The next chapter will further describe the results that had been obtained and discuss the implication of this study and provide provision of few recommendations relevant to this study.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATION

This last chapter contains three sections the first section deal with summary of the finding, the second section is devoted to 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 within the following purpose in mind (1) to describe the current status of the tanneries in Addis Ababa (2)To what extent barriers that impediment the implementation of Green supply chain (3)To examines the barriers relationship to the implementation of green supply chain management in Addis Ababa tanneries.

- From the demographic characteristics of the respondents there were 83.5% male and 16.7% female besides the large number of the respondent (71.8%) their level of education had first degree. Regarding to respondents service duration, the majority of (69%) 5 year to less than 10 year were managerial level employees who had direct connection with supply chain operation of companies.

- Most of the tanneries in Addis Ababa (72%) implemented Environmental Management System (EMS), 16.7% of them implement and 7.1% of them are in progress. Moreover 54% of the tanneries have environmental certification (ISO 14001) and the rest 45.2% of them not yet certified.

- From the interview conducted with leather industry development institute (LIDI) and the environmental protection authority of the city administration that most tanneries in Addis Ababa contribute to pollute environment by their solid and liquid wastes. However, most tanneries have engaged in installation of treatment plant for liquid waste, and some of them tried to reuse solid waste for the production of glue but as compared to this the amount solid waste generated is huge.

- This study revealed that all the independent variable had negative correlation with the dependent variable. Besides organizational barrier has strong correlation with implementation of GSCM (r=0.758, p<.000),technological barrier has strong correlation with implementation of GSCM (r=.712,p<.000), informational strong correlation with implementation GSCM (r=0.648,p<.000), as well as company's lacks perception on environmental impact has strong correlation with implementation of GSCM of (r=0.509, p<.001), however financial barriers had weak correlation with the implementation of GSCM(r=0.374).Furthermore, the regression analysis revealed that organizational barriers, technological barriers, informational barriers and Company's lacks perception on environmental impact are statistically significant (at P<.05) and their standardized coefficient beta (β) values -.328, -.268, -.253 and -.218, respectively. On the other hand the beta (β) value of the financial barriers was -.0.074 at P- value of .433; this implies that its predictive power weak and as well statistically insignificant. The beta values showed that the predictive power the above dimensions of independent variables. Thus, the greatest impediment that hinder the implementation of GSCM in Addis Ababa tanneries ,were followed by organizational barrier, technological barrier, informational barrier and company's lacks perception on the environmental impact.

- In the descriptive analysis, It was found that lack of perception on environmental impact revealed along tanneries in Addis Ababa, Moreover the interview conducted showed that there is low level of attitude towards pollution.

- It was identified that organizational commitment one of the barrier that impedes the GSCM implementation across the tanneries. In addition the interview response shows currently tanneries in Addis Ababa, they have inadequate recycling plant for their solid waste.

- From the descriptive statistics analysis result the technological barrier impedes implementation of GSCM .This leads to that company's lacks adoption of related technologies.

- It was identified that informational barriers impede the implementation of GSCM in Addis Ababa tanneries through inadequate knowledge on green practices, reverse logistics adoption, on environmental impact and less aware of their customer and supplier concerning about GSCM.

- In this study 70.7 % of the variance dependent variable implementation of GSCM explained and predicted by independent variables (Company's lack of perception on environmental impact, organizational, technological, financial and informational, barrier) were able to and only 29.3 % of the variation in the dependent variable is to be determined by the variable outside of the study model.

5.2 Conclusions

The research aimed to indentify several barriers to the implementation of green supply chain management among the Addis Ababa tannery companies. The finding of this study suggests that the company's lack of perception on environmental impact, organizational barrier, informational barrier and technological barrier have significant relationship with the implementation. There is also relationship with financial barrier and implementation of GSCM, but they are weak correlated. Furthermore, the overall findings of this particular study revealed that with the range of predictive power; organizational barrier, technological barrier, informational barrier and company's lack of perception on environmental impede the green supply chain management.

According to the data analysis and the findings indicated that company's lack of perception on environmental impact contributes and significantly affect the implementation of GSCM. The study therefore concludes that it is barriers for tannery companies in Addis Ababa.

Based on the finding organizational barrier is priority category of barrier for implementation GSCM in Addis Ababa's tanneries. The empirical evidence confirmed that the commitment of top and middle managements were not good in implementation of green supply chain management in tanneries. Therefore, it is possible to conclude that organizational barriers the major barriers for the implementation of GSCM.

It was also identified that technological barriers that might impede the implementation of GSCM in Addis Ababa's tanneries. It was confirmed and mentioned in the empirical literature; lack of technology has greatest impact in implementation of green supply chain management. From this study it can be concluded that technological barriers hinder the implementation of GSCM in Addis Ababa's tanneries.

The findings of the study indicated that information related to GSCM and its implementation is not well addressed. Therefore, informational barriers impede the implementation of GSCM.

The research objective and research question have been addressed and this study also contribute to the gap of the problem statement. The findings of this study provide contribution to practical industry. The result of this study can be used as guideline by various parties such as tanneries, policy maker, regulation agency and researcher to formulate their business strategies related to implementation of GSCM.

5.3 Recommendations

- In order to be able to enhance the company image and to get external legitimacy, to increase internal efficiencies and create competitive advantage opportunity and economic benefits. Tanneries should achieve the ISO 14001 certification with strong commitment to reducing pollution.

- As stated in literature reviewed, Zhu and Sarkis (2007) mentioned on their institutional theory, Government regulation can be one of the main institutional factors that driven business to implement green supply chain practices. Thus, government should support the tanneries towards implementation of green supply chain management.

- Since company perception on environmental impact has significant influence on implementation of GSCM Tanneries; Company's top management should provide environmental awareness for their employee and educate them about the benefit and advantage of GSCM. The way GSCM benefits the companies are ; increase the revenue, customer satisfaction, market opportunity and waste minimization mentioned are the main one.

- Regarding to organizational barrier top management needs to take the initiative of change management by increasing awareness among the stake holder and able to plan both short term and long term goal of GSCM in order to gain successful implementation. Moreover, as stated in literature, Ojo *et al. (*2014) and Govindan *et al.* (2014) they were mentioned that the commitment, guidance, support and leadership from the top management practices. Luthra *et al.* (2011) stated as well organizational barrier main difficulty to implement fundamental change in the organization. Thus, the management of Addis Ababa tanneries should use different GSCM strategies to decrease their environmental impact and to stay in the competition.

- In regards to technological barrier, the result shows that the current technology and infrastructure of the tanneries are not supported by new technologies. Therefore companies could implement strategies such as use of cleaner technologies and provide more funds for implementation of technologies to increase the implementation of GSCM. Moreover to overcome the current solid waste problem of the most Addis Ababa tanneries, they should implement closed- loop strategies. This strategy involves the capture and recovery of materials for either remanufacturing or recycling through integration, coordination across partners.

- In the informational barrier this study finding suggests that tanneries in Addis Ababa do not have the correct information about GSCM. This might be due to the lack of awareness and understanding on the advantage of GSCM. Therefore the government could reduce this barrier by providing more training and activities for tanneries to participate in order to change their perception of GSCM.

5.4 Limitation and Suggestion for Future Studies

- In this study 29.3% of the variance in dependent variable (implementation of GSCM) was not explained and predicted by independent variables (company's lacks perception on environmental impact, organizational barrier, and technological, financial and informational barriers). So that other researcher could explore more by including additional independent variables.

- Further studies might also investigate the impact of Environmental Management System (EMS) certification such as ISO 14001with 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 Addis Ababa tanneries companies.

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APPENDIX A:
QUESTIONNAIRE
ADDIS ABABA UNIVERSITY
COLLEGE OF COMMERCE SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Dear Respondents,

The intent of this questionnaire is gathering information to a thesis to be conducted with regard to the **Impediments of Green Supply Chain Management Implementation in Addis Ababa Tannery Companies,** in partial fulfillment of the requirements for the Master of Logistics and Supply Chain Management Degree and; to be submitted to Addis Ababa University School of Graduate Studies Faculty of Business and Economics to Logistics and Supply chain Department. Therefore, I humbly request you to consider your participation in responding the questionnaire is in high importance so as to give the researcher 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 demand your valuable support in filling the questionnaire as patiently and frankly as possible.

Thank you for your time and consideration!

Contact address +251911 64 05 07

Instruction: Please, put a tick (□) mark in which you want to select.

Part I: General Information

1. Gender?

   Male ☐ Female ☐

2. What is your age?

   ☐ 18-25 ☐ 26-35 ☐ 36-45

   ☐ 46-55 ☐ Above 55

3. What is the highest level of education you received?

☐ Secondary Education ☐ College Diploma ☐ Undergraduate Degree

☐ Master Degree ☐ Doctoral Degree

4. What is your job title?

☐ General Manager ☐ Facility Manager ☐ Logistics / Warehouse Manager

☐ Sourcing Manager ☐ Officer and Above

5. How long have you been in this company?

☐ Less than 1 year. ☐ 1 year to less than 3 years

☐ 3 years to less than 5 years ☐ 5 years to less than 10 years

☐ 10 years or more

6. Is there currently an Environmental Management system in place in your company ?

☐ Yes

☐ No

☐ In Progress

7. If yes, what is the company official Certification?

☐ ISO 14001

☐ Other, Please specify; _____

Part II: Question directly related to the study

Section A: This section inquires about your view on the Impediments of GSCM to implements in your company. You are required to indicate the extent of your agreement for each statement based on the 5 – Points likert scale.

No.	Questions	Very Low Impact	Low Impact	Moderate Impact	High Impact	Very High Impact
Company's lack of Perception on environmental impact						
1.	Company's lacks Perception on Environmental Impact of Waste Generation					
2.	Company's lacks Perception on Environmental Impact of Air Pollution					
3.	Company's lacks Perception on Environmental Impact of Waste Pollution					
4.	Company's lacks Perception on Environmental Impact of Deposits to land					
5.	Company's lacks Perception on Environmental Impact of Health and safety hazards					
6.	Company's lacks Perception on Environmental Impact of noise pollution					
7.	Company's lacks Perception on Environmental Impact of Heat (Visual) light pollution					
No.	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Organization Barriers						
1.	The top management commitment in implementation of Green supply Chain management is low					
2.	The middle management commitment in implementation of Green supply Chain management is low					
3.	The company is less concern on corporate social responsibility					
4	The company's culture hinders the implementation of GSCM.					
5.	The company is less concern on recycling and reuse of forts throughout the supply chain					

No.	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Technological Barriers						
1.	The company lacks of IT application to implement Green Supply Chain Management					
2.	The company is resistant in implementing advance technology for Green Supply Chain Management					
3.	There is a high fear of failure if company implements GSCM					
4	The company lack of technical expertise in field of GSCM					
5.	There is complexity of design/ structure to implement GSCM					

No.	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Financial Barriers						
1.	It is overall costly to implement Green supply Chain Management for the company					
2.	There is limited (restricted) availability of bank loans to encourage Green supply Chain Management					
3.	The cost is higher for waste treatment than proper disposal					
4	The training cost is high if the company implements GSCM					
5.	It is more costly to purchase environmental friendly materials					
6.	The cost of financing Green supply Chain Certification such as ISO 14001 is high.					

No.	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Informational Barriers						
1.	The company does not have sufficient knowledge in green practices.					
2.	Our customers are less aware of Green supply Chain management.					
3.	Our supplier are less aware or concern about Green supply Chain Management					
4	The company does not have sufficient knowledge in reverse logistics adoption.					
5.	The company does not have sufficient knowledge in environmental impact.					

Section B: Incorporates issues related with implementation Green supply Chain Management. You are required to indicate the extent of your agreement for each statement based on the 5 – Points likert scale.

No.	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Barriers/Impediments in Implementation of GSCM						
1.	There is low Company's perception on environmental impact and GSCM. Implementation is low.					
2.	There exist lots of organizational barriers and GSCM implementation is low					
3.	There exist lots of Technological barriers and GSCM implementation is low					
4	There is inadequate Financial resource and GSCM implementation is low					
5.	There exist lots of Informational barriers and GSCM implementation is low					

APPENDIX B:
INTERVIEW QUESTIONS
ADDIS ABABA UNIVERSITY
COLLEGE OF COMMERCE SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

For:

- Environmental Technology Directorate, Director of Leather Industry Development Institute (LIDI).
- Deputy Manager of City Government of Addis Ababa Environmental Protection Authority

1. What does the green industry transformation of Tannery companies in Addis Ababa looks like?
2. What are the wastes that Addis Ababa's tannery companies emit in to the environment and that have significant environmental impact?
3. How do you describe the role of Addis Ababa's tannery companies in bringing sustainable economic development?
4. Is there any serious problem that Addis Ababa's tannery companies create on the people living nearby their infrastructure?
5. How do you descript the effort of Addis Ababa's tannery companies in converting or mitigating the impact of pollutants in to valuable products?
6. What are the impediments and problems facing the Addis Ababa's tannery companies in implementation of Green Supply Chain Management?
7. What need to be done to implement Green supply Chain Management?

   a. Reduction of waste along the supply chain
   b. Control of solid waste, discharges and air emissions in the supply chain
   c. Control and abatement of pollution
   d. Propose initiatives for technology and knowledge transfer

Thank you for your cooperation