ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

THE CHALLENGES AND PROSPECTS OF IMPLEMENTING REVERSE LOGISTICS IN PHARMACEUTICALS: THE CASE OF EPHARM

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A thesis submitted to the School of Commerce of Addis Ababa University in Partial fulfillment of the requirements for the award of the degree of Masters of Arts in Logistics and Supply chain Management

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ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

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Acronyms and Abbreviations

RL:	Reverse Logistics
EPHARM:	Ethiopian Pharmaceutical Manufacturing
EOU:	End of use
GMP:	Good Manufacturing Practice
PSC:	Pharmaceutical Supply Chain
R&D:	Research and Development
SD:	Standard Deviation

Abstract

This study was carried out to assess the challenges and prospects of implementing reverse logistics in EPHARM Share Company. The population of study consisted of 32 respondents from marketing and sales, finance and technical/production departments. The objectives of study were to assess the practice of reverse logistics in EPHARM, identify the challenges involved in implementing reverse logistics in EPHARM, identify the possible opportunities of implementing reverse logistics in EPHARM and forward possible policy implications and recommendations. The research design was a descriptive research design. Data was collected using questionnaires administered through drop and pick later method. Twenty seven questionnaires were returned, representing 84% response rate. Mean scores, standard deviations and percentages were the outputs of the objectives. The findings came up with a conclusion that EPHARM Share Company has adopted reverse logistics practices with reuse and disposal being predominant although they face challenges that need to be addressed in order to further increase efficiency. The findings also showed that implementing reverse logistics plays a great role on the economic, market and mostly green image of the company. The study recommends that EPHARM should invest in appropriate technology for reverse logistics and have detailed and modern disposition strategies for their returned products, work hand in hand with distributers to reduce the rate of return, train high level managers to give emphasis to the matter so as to improve efficiency and productivity of the reverse logistics processes.

Key words: Reverse Supply chain, Reverse logistics, Pharmaceutical reverse logistics

Chapter One

Introduction

A supply chain may be defined as an integrated process wherein a number of various business entities (i.e., suppliers, manufacturers, distributors, and retailers) work together in an effort to: (1) acquire raw materials, (2) convert these raw materials into specified final products, and (3) deliver these final products to retailers. This chain is traditionally characterized by a forward flow of materials and a backward flow of information (M.Beamon, 1998). In recent years the concept of integration and collaboration of the supply chain is not limited to its forward flow but includes the backward flow which is known to be the reverse flow or reverse logistics.

Rogers and Tibben-Lembke defined reverse logistics as "the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods, and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal." In day to day business activities, returns are bound to happen and organizations have to come up with better strategies of handling the reverse flow of products by according reverse logistics importance and incorporating it as a component of overall business strategy as profitable and sustainable business strategy. (Mogaka, 2015) Various reasons such as warranty failures, incorrect product orders or shipment, damaged products, product recalls, reusable packaging materials and product upgrading account for reverse flow (Kabir, 2013);Kwame *et.al* 2014)

Recently, considerable attention has been given to the study of reverse logistics in the pharmaceutical manufacturing industry. Ample time and resources are now being devoted to the understanding of reverse logistics practices by companies who previously did not do so. Almost all businesses must deal with some nature of return due to issues of marketing returns, quality problems, overstock, goods brought back for refurbishing or re-manufacturing. Learning to manage reverse flow is of key importance for various industries since return rates differ significantly from business to business ((Rogers and Tibben-Lembke, 2001); Kwame et.al, 2014)

Not only that but reverse logistics plays a great role in company's competitive advantage and insuring customer sustainability and satisfaction, decreasing resource investment levels, and reducing its storage and distribution costs, thereby increase its customer loyalty (Abbas, 2012)

Reverse logistics or end of life management of medicines is very crucial. This is because as medicines are very useful for curing and insuring health care, they are also risky when not properly managed or if fallen into the wrong hands. In general the main sources of health risks as a result of medicines waste are contamination of drinking water, air pollution caused by release of toxic pollutants, endangered aquatic life due to non-biodegradable chemicals, and reuse of expired medicine. (E. Ejigu et.al, 2012)

With increasing competition in pharmaceutical industry, industry players have to come up with new ways of increasing profit margins, customer satisfaction and environmental conservation hence improved firm image, reverse logistics may be the solution. (Mogaka, 2015).

Therefore, this paper presents quantitative assessment on the current practice, challenges faced and future possibilities of implementing reverse logistics in EPHARM. It gives an insight in to the pharmaceutical's reverse logistics practice, its challenges as well future prospects that affect the company's overall performance.

1.1. Statement of the problem

Environmentally responsible practices in supply chain management are referred to us as green operation. Reverse logistics, which involves flow of products or materials back upstream through the supply chain, is an important element of green operation. (Mogaka, 2015) . Companies and their supply chain managers can no longer afford to treat reverse logistics as an afterthought. There is just too much at stake in terms of brand protection, sustainability requirements and ultimately profitability ((Rogers et al, 2013); Mogaka, Lilian Moraa, 2015). The European Working Group on Reverse Logistics, RevLog (1998), forwards the following definition: "The process of planning, implementing and controlling flows of raw materials, in process inventory, and finished goods, from a manufacturing, distribution or use point to a point of recovery or point of proper disposal" (Marisa P. de Brito and Rommert Dekker, 2002)

Business firms are giving great attention to the forward flow of goods by creating a much simple and fast supply chain these days. But they seem not to give the same attention to the backward flow of products that are unfit or returned. Especially in developing countries, firms seem to neglect the essence of implementing reverse logistics and obtain its benefits. Reverse logistics in the pharmaceutical industry is particularly important from the economic, environmental as well as regulatory point of view (Manoj Kumar T. and S. Saravanan, 2016). Improper management of returned drugs can involve rerouting into the black market and relabeled for sale or disposed of into sewerage and landfill. This would have negative impact on the health of the people and the environment in the long term. Another aspect has to do with securing and proper disposal of returned products. Thus, it is increasingly important to implement an improved reverse logistical chain to provide a cost effective, tract and trace options for the pharmaceutical supply chain (Kwame et.al, 2014).

In Ethiopia, the story is no different from other developing countries. Since the pharmaceutical industry is a straggling industry reverse logistics is a young concept. Not only that but as to the knowledge of the student-researcher, little or no research has been made in Ethiopia to examine the practice of reverse logistics in pharmaceuticals and the challenges faced. Therefore, the study has tried to pinpoint the major issues concerning the practice of reverse logistics with in the pharmaceutical industry, its challenges and what the future holds.

1.2. Research Questions

The objective of this study was to carry out the challenges and prospects of implementing Reverse logistics in Pharmaceuticals. In order to achieve the stated objectives the following research questions were formulated:

1. What is the current reverse logistics practice of EPHARM?
2. What are the drivers for implementing reverse logistics practice at EPHARM?
3. What are the challenges faced when implementing reverse logistics practices EPHARM?
4. What are the opportunities that encourage the implementation of reverse logistics with in EPHARM?

1.3. Objectives of the study

General objective

The general objective of this study was to identify the challenges and prospects of implementing reverse logistics in EPHARM Share Company.

Specific objectives

This study aimed to:

- Review the practice of reverse logistics in EPHARM.
- Identify the challenges involved in implementing reverse logistics in EPHARM and
- Identify the possible opportunities of implementing reverse logistics in EPHARM.

1.4. Scope of the study

The study is designed to assess the practice of implementing RL and its challenges in the pharmaceutical industry. In order to do so, a case study was under taken on EPHARM Share Company which is the first and the oldest as well with a larger percentage of production capacity in the industry. Thus the study only focused on EPHARM's current practice of the subject matter and the challenges the company faced in doing so on the bases of some selected key dimensions which have been adopted to identify issues in RL practice.

1.5. Significance of the study

The findings of this study benefit management of the case study pharmaceutical manufacturing firms EHARM share company and other pharmaceutical manufacturing companies in the country by providing them with a deeper understanding and appreciation of the impact of reverse logistics on firm performance and help them take it as an opportunity to make a difference in their supply chain. It provides insights on the extent to which reverse logistics has been adopted in developing countries and the challenges faced in implementation.

It also aids policy makers in decision making process when coming up with legislations that promote adoption of reverse logistics practices in pharmaceutical industry. This study also stimulate interest for further research on this topic by academicians on the knowledge gaps and future studies can draw ideas from it and improve on it.

1.6. Organization of the research

Chapter 1 – provides a background and the underlying logic of this study and the importance of researching this topic is stressed. The chapter ends up in the purpose of the study as well as the scope of the research. **Chapter 2** – provides an in-depth theoretical background of previous research in the field. The theoretical concepts are also identified in this chapter. **Chapter 3** – presents the methodological decisions of the data collection and the methods used for analyzing the data and the methods used to present the data. **Chapter 4** – presents a comprehensive analysis of the results of the study and interprets the findings of the collected data. **Chapter 5** – provides a summary of the findings, conclusions and recommendations.

1.7. Operational definition of terms

- **Pharmaceutical manufacturing companies**: Are those companies that produce drugs for humans, medical supplies, laboratory reagents from raw materials.
- **Reverse Logistics**: "The process of planning, implementing and controlling flows of raw materials, in process inventory, and finished goods, from a manufacturing, distribution or use point, to a point of recovery or point of proper disposal" (Roberta Pinna and Pier Paolo Carrus, 2012)

Chapter Two

Related Literature Review

1.8. Concept of Reverse Logistics

In common scenario a product or service is developed to be manufactured or created and go through the supply chain (e.g. manufacturer-wholesaler-retailer) to be sold to a consumer. But products are returned to the manufacturer or retailer for any number of reasons. Some of the more common reasons are warranty failures, damaged products, product recalls, incorrect product orders/shipment, exchange of impaired products for functional ones, reusable packaging materials, product upgrading and so on. Whatever the reason, returned goods have to be processed in the best manner possible. Reverse logistics is then the proper handling of products back to manufacturer's or producer's end. Essentially, reverse logistics is the opposite of logistics management. Goods or materials move in the opposite direction of the supply chain, that is, from the customer back to the supplier (Kabir, 2013). The conception of RL dates from long time ago, but the denomination of this term is difficult to trace with precision. During the 1980s, the definition was inspired by the movement of flows against traditional flows in the supply chain (reverse distribution, reverse channel); at the end of the 1990s, RL was characterized by recovery of the value of EoU (end of use) products and the processes involved; now, a holistic view of the supply chain is proposed by considering forward and reverse flow from a business perspective, the so-called CLSC (Sergio Rubio, and Beatriz Jiménez-Parra, 2014).

The European Working Group on Reverse Logistics (RevLog) define reverse logistics in a most elaborate and fit to all possible situations way "The process of planning, implementing and controlling flows of raw materials, in process inventory, and finished goods, from a manufacturing, distribution or use point, to a point of recovery or point of proper disposal" (Roberta Pinna and Pier Paolo Carrus, 2012).

If we analyze carefully these definitions most of the authors agree that they are basically discarded products, used products, products or parts previously shipped, hazardous and non-

hazardous waste from packages and products, information, raw materials, in process inventory and finished goods. These inputs identify the scope of the RL process. Some of them limit the input to only waste or recycled products, but others allow a wider concept where information, raw materials, inventories and goods are managed through the RL system. (Roberta Pinna and Pier Paolo Carrus, 2012).

Reverse logistics is getting a great attention this days since businesses are looking into different ways of competition as well the market is filled with customers with demands more than just the product but the environmental relevance of the product as well. Many forces drive reverse logistics, like, competition and marketing motives, direct economic motives and concerns with the environment (Kabir, 2013).

1.9. Reverse logistics practices

The implementation of reverse logistics is necessary to achieve the goals of sustainable development which focuses on both environmental and economic goals ((Dowlatshahi, 2000); Paul Wanjora Kariuki an d Esther Wangethi Waiganjo, 2014,). The goal in reverse logistics is to achieve practice excellence so as to enhance customer equity by investing in resources to build customer loyalty and satisfaction ((Rust et al, 1999); Lilian Moraa Mogaka, 2015). This can be achieved by reducing cycle time through taking back returned items quickly and crediting them in a timely manner. As a by-product of enhancing customer equity and through its asset recovery efforts, reverse logistics yields other benefits to the firms including revenue generation, expense reduction, asset efficiency improvement and environment protection ((Carbone & Moatti, 2008); Lilian Moraa Mogaka, 2015)

Firms should efficiently and effectively get the products from where they are not wanted to where they can be processed, reused and salvaged. The firms must also determine the disposition of each product. That is, for each product inserted into the reverse logistics flow, the firm must decide its final destination ((Rogers & Tbben-Lembke, 1998); Mogka, Lilian Moraa, 2015). Reverse logistics involves re-use and recovery of products, hence reducing the negative effects on environment and waste disposal ((Kleindorfer et al., 2005); Paul Wanjora Kariuki and Esther Wangethi Waiganjo, 2014).

Once a product has been returned, the firm has many disposal options from which to choose. If the product can be returned to the supplier for a full refund, the firm may choose this option first. If the product has not been used, it may be resold to a different customer. If the product cannot be sold "as is" or if the firm can significantly increase the selling price by reconditioning, refurbishing or remanufacturing the product, the firm may perform these activities before selling the product. If the product cannot be reconditioned in any way, because of its poor condition, legal implications or environmental restrictions, the firm will try to dispose of the product at the least cost. Any valuable materials can be reclaimed, any recyclable materials removed before the remainder is sent to a landfill ((Rogers & Tbben-Lembke, 1998); Mogka, Lilian Moraa, 2015).There are three concepts on which reverse logistics is based and these are reuse, remanufacturing and recycling ((Eltayeb et al, 2011); Lilian Moraa Mogaka, 2015)

2.2.1. Reuse

Is the process of collecting used products from the field, and distributing or selling them as used. Thus, although the ultimate value of the product is reduced from its original value, no additional processing is required ((Beamon, 1999; Wells and Seitz, 2005); Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011). Mainly involves products returned by retailers back to manufacturers due to slow movement on the shelves, wrong orders or oversupply and packaging materials taken back such as beer and soda bottles (Mogaka, 2015). (Kleber et al (2003); Lilian Moraa Mogaki, 2015), conducted a case study on reverse logistics in Schering (a pharmaceutical firm in Germany) and found out that there is reuse of solvents in the production process mainly for economic reasons although environmental concerns play a role. After use, impure solvents are cleaned in a distillation facility then re-used as long as this option is economically attractive. If cleaning is too expensive due to a high degree of pollution, the impure solvents are thermally recycled if possible or disposed of.

2.2.2. Recycle

Is the process of collecting used products, disassembling them (when necessary), separating them into categories of like materials (e.g., specific plastic types, steel, glass, paper, etc.), and processing them into recycled products, components, or materials. In this case, the identity and functionality of the original materials is lost. ((Beamon, 1999; Wells and Seitz, 2005); Tarig

Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011). Recycling behaviors are classified as proactive green approaches, and the most far-reaching approach is value-seeking in which companies have the strategic initiative to integrate environmental practices into the business strategy and operate the company to reduce impact on the environment ((Kopicki et al., 1993); Ying Xie* and Liz Breen**, 2010)

Recycling involves dismantling the product and removing parts or materials from a returned product, so that they can be utilized as raw materials for a new product or package. The waste is then sent to a landfill or burnt; this reduces consumption of fresh raw materials. This type of reverse logistics was also taking place in Schering (Kleber *et al*, 2003), the by-products obtained from many stages of the production process contain valuable materials hence reusing them is economically attractive since it reduces the need for virgin materials. They found that in Schering, about 630 tons of active ingredients are produced resulting in 14 tons of by -products and more than 90 percent of the by-products are recycled. (Kleber et al (2003); Lilian Moraa Mogaki, 2015)

2.2.3. Remanufacture

Is the process of collecting a used product or component from the field, assessing its condition, and replacing worn, broken, or obsolete parts with new or refurbished parts. In this case, the identity and functionality of the original product is retained. ((Beamon, 1999; Wells and Seitz, 2005); Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011).

Remanufacturing is a form of product recovery that involves rebuilding of the product to manufacturers specification using a combination of reused, repaired and new parts. Repair involves the least amount of effort to upgrade the product and remanufacture involves the greatest. (Mogaka, 2015)

2.2.4. Dispose

In today’s scenario management of waste become the prime concern for every nation and particularly when we talk about Pharmaceutical industry it is more important to manage the disposal of unused, expired medicines through a proper Reverse Logistics channel. As some of the medicines content hazardous chemical like mercury, radioactive component and some

poisons component the disposal of unused, expired medicines is become a burning issue. (Shaurabh Singh*, Saurabh Bharati and Moti Kumar, 2013)

1.10. Reverse Logistics implementation and its benefits

Resource recovery, valuable information, satisfaction of supply chain partners, regulatory compliance, reduced total cycle time, and improved company image may be some of the major benefits for companies implementing reverse logistics program. It has been found that for reaping these benefits, simplicity of return process, affordability of return costs, and high responsiveness are the main prerequisites. (Haidar Abbas and Jamal A Farooquie, 2013). Typically, competitive, marketing, economic and environmental reasons are all factors that have been identified as relevant for the organizational adoption of RL activities and functions ((Ravi and Shanker, 2005); Sushmita A. et.al, 2014)

For businesses, direct (cost reduction, value added recovery and input material) and indirect gains (anticipating impending legislation, market protection, green image, improved customer/supplier relations) are economic drivers. A second type of drivers is legislation related, as there is an increase in environmentally related legislation. Original supply chain players are more often held responsible for the collection and recovery of their end-of-life products. This end of life take-back responsibility is referred to as Extended Producer Responsibility or EPR ((Lifset, Lombardi, 1997); Gertjan De Boever and Thijs Van de Velde, 2009). Corporate citizen ship or being socially responsible is another driver for implementing reverse logistics with in a company.

2.3.1. Economic

Economics as a driving force relates to all recovery actions where the company has direct or indirect economic benefits. Even with no clear or immediate expected profit, an organization can get (more) involved with Reverse Logistics because of marketing, competition and/or strategy drivers. Companies may get involved with recovery as a strategic step to get prepared for future legislation. On the other hand, a company may envisage certain conditions in the long-run, e.g. impending legislation. In face of competition, a company may recovery to prevent other companies from getting their technology or from preventing them to enter the market. A

company may recovery to get a good (environmental) image with the customer or getting a better relation with the customer (Marisa P. de Brito and Rommert Dekker, 2002). Making profit and financial returns are the most important objectives of business organizations. In this sense, every decision is evaluated based on cost–benefit criteria. (Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011)

Making profit and financial returns are the most important objectives of business organizations. In this sense, every decision is evaluated based on cost–benefit criteria. Environmental initiatives are expected to come along with this general rule, i.e., a firm needs to expect business benefits from green initiatives before it engages in these initiatives. Expected business benefits indicate that companies adopt reverse logistics activities, such as recycling and reusing of products and materials, in anticipation of the fact that these activities have the potential to improve profitability of these companies through cost minimization and increased revenues ((Stock et al., 2002); Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011). In sum, the economic driver embraces among others, the following direct gains like input materials, cost reduction, value added recovery and indirect gains such as anticipating/impeding legislation, market protection, green image, and improved customer/supplier relations. (Marisa P. de Brito and Rommert Dekker, 2003).

Decreasing the use of raw materials; companies are not able to anticipate the amount and timing of product returns. It can benefit from the usable parts of returned products in the production of new products. Thus, the cost of new raw material supplies decrease. (M.Şükrü Akdoğa and Ayşen Coşkun, 2012)

Marketing objectives; companies are expected to be green in every aspect of their operations by society and government. Thus a 'green' image has become an important element in marketing strategies. A green image is not only producing green goods but also carrying out other activities environmentally responsibly. This objective can be as well part of a customer relationship strategy ((De Brito and Dekker 2004); M.Şükrü Akdoğan and Ayşen Coşkun, 2012). In a competitive industry environment, companies may be obliged to explore new options for take-back and recovery products to better meet consumer expectations. Also there is an

opportunity to develop relationships in the business environment by expressing the environmentally consciousness image. (M.Şükrü Akdoğa and Ayşen Coşkun, 2012)

Customers represent the major financial stakeholders that buy products and services of organizations. As such, customers can exert considerable pressures and may communicate goals of sustainability or environmental performance on these organizations. Previous studies found that customer pressure is one of the major drivers for reverse logistics (Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011)

2.3.2. Social (Corporate Citizenship)

“Extended Responsibility” or “Corporate Citizenship” concerns a set of values or principles that drive an organization to become responsibly engaged with particular activities, including reverse logistics. An enhanced “green” reputation – being seen to be concerned about and proactive towards environmental issues – has become an important marketing element and can improve customer relations. Many companies now have extensive programs on responsible corporate citizenship where both social and environmental issues become the priorities (A.J. Hickford and Dr. T.J. Cherrett, 2007).

The environmental aspects focus on resource reduction, materials substitutions and waste reduction, whereby companies become more environmentally efficient and contribute to the solution of environmental problems ((Carter and Ellram, 1998; Mclntyre et al., 1998);Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011) The interest for reverse logistics is expected to emanate not only from the external environment (regulations and customers) but also from the internal sense of responsibility of a firm towards the society in which it exists. For reverse logistics, such sensitivity is intensified by the ever-increasing environmental problems such as global warming and pollution. Such problems are expected to raise the awareness of business firms to behave in a more socially responsible manner and reflect an image of due diligence and commitment to sustainability and social responsibility ((Beamon, 1999; Wells and Seitz, 2005); Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani*, 2011). Corporate citizenship refers to the set of values or principles that an organization holds to be responsible with RL activities. The motivations behind the implication of RL activities lay on both being legally obliged and trying to establish an image the consumers desires as an environmentally

responsible organization. Better customer services such as increasing the level of customer awareness for returning and refunding options, guaranteeing better services would affect company's image positively and provide potential benefit (M.Şükrü Akdoğa and Ayşen Coşkun, 2012).

Decreasing waste materials; because of the increase in environmental problems, customers impose strong pressure on companies to take environmental aspects into account. Thus, they will benefit from being environmentally friendly in production and be able to decrease waste materials and cost of waste disposal. (M.Şükrü Akdoğa and Ayşen Coşkun, 2012)

2.3.3. Obligation to Legislation

Business organizations are expected to adopt green purchasing in response to environmental regulations set by various regulatory institutions such as government bodies inside the country, regulations in other (mainly export companies), in addition to regulations set by the parent companies. Such regulations take the form of formal rules, laws, sanctions and incentives ((Scott, 1995); Tarig Khidir Eltayeb and Suhaiza Hanim Mohamad Zailani, 2011).Since the strict legislations about the environmental issues express the extended producer responsibility, companies are entitled to recover their products or accept them back. Companies are holding accountable for the whole product life cycle anymore (M.Şükrü Akdoğa and Ayşen Coşkun, 2012).

1.11. Reverse logistics in pharmaceuticals

Pharmaceutical sector is possibly one of the most important sectors where the high costs of products, low to moderate shelf lives, and potential for unscrupulous intermediaries compromising the integrity of products are major concerns. In addition, infiltration of counterfeit medicine and hazards associated with misuse of many of the products give ability to track, recall, retrieve, salvage, and ensure effective removal when necessary a very high degree of importance for the pharmaceutical industry (Asma Khan and Masood Subzwari, 2009). Reverse logistics in the pharmaceutical industry is extreme important, not only from the economic point of view, but also from the environment as well as regulatory point of view (Kabir, 2013).

Pharmaceutical producers combine ingredients precisely, under specific conditions, while negotiating a maze of stringent regulations and quality controls. Companies that manufacture, move or store pharmaceutical products must meet similar demands. Many drugs are highly sensitive to temperature; some are extremely valuable; and all are subject to a complex array of government and international regulations. In the pharmaceutical supply chain, every detail counts. Pharmaceutical logistics is such a specialized discipline that drug manufacturers have long been reluctant. But some recent industry trends are making drug manufacturers rethink their strategies. One trend is that some popular drugs are coming off patent. Without popular products to boost their bottom lines, manufacturers try to make up the difference by cutting costs. One way they do this is through cutting cost in logistics operations (Kabir, 2013).

A pharmaceutical supply chain are characterized by the high level of wastage and spillover and also faces the common issues of returns and recall of drugs, companies require a proper system in place to deal with such circumstances (Haidar Abbas and Jamal A Farooquie, 2013).It is characterized by high R&D investment, high quality constraints, long production times, high waste to product ratios and shortening product cycles, all of which can result in high margins for sales along the pharmaceutical supply chain (PSC). The high waste to product ratios also explains the focus of research on environmental issues and waste minimization in the production stages. (Sushmita A et.al, 2014).

As medicines are generally high value chemicals which are critical to the health of consumers, the proper management of product returns, expired stock and product recalls is necessary through the implementation of efficient reverse logistics systems in the pharmaceutical industry (Sushmita et.al, 2012).

Typically, studies on RL in the pharmaceutical industry address issues either at the level of production or at the levels of distribution and sales. Additionally, product characteristics (e.g. expiry dates and pricing) and external factors (e.g. regulatory constraints, market behaviors, impact on consumers and environment, information systems (ISs) infrastructure) have to be considered in more detail. Given the critical value of drugs, the regulation of safe manufacturing, distribution and sale of medicines is also a priority for government authorities (Sushmita A et.al, 2014).

1.12. Challenges of implementing RL

There are quite few studies which analyzed the major barriers in the context of developed countries. Even though enough evidence in terms of regulations, awareness, public participation, resources and government support exist in Europe they found few criticalities in implementing RL (Muhammad D Abdulrahman and Nachiappan Subramanian*, 2012)

2.5.1. Lack of awareness about RL

The lack of awareness of benefits of reverse logistics is a major barrier for its implementation. Today, the customers have the benefits of greater product variety. It has resulted in an increase in unsold products, rate of returns, packing materials, and also the waste. This has given rise to increase in the volume of product returns in the form of reverse logistics. The reverse logistics can lead to economic benefits by the recovery of the returned products for reuse, remanufacturing, recycling, or a combination of these options for adding value to the product (S. K. Sharma et.al, 2011).

2.5.2. Management inattention

The conventional wisdom has been that over the last few years, most companies have practiced reverse logistics primarily because of government regulation or pressure from environmental agencies, and not for economic gain. Thus the management is taking less interest thinking no-profit issue. Companies are organized around the forward flow of goods. (S. K. Sharma et.al, 2011).

2.5.3. Financial constraints

Cost considerations are a prime challenge in commercial recycling. Companies require allocation of funds and other resources for the implementation of reverse logistics. Information and technological systems require more funds because without these, the returns product tracking and tracing and product recovery by various processes like reuse, remanufacturing, recycling, etc. is not possible in the present environment. The training of personnel related to the reverse logistics is also very important for efficiently managing and eventually making the reverse logistics.

2.5.4. Personnel resources

A significant barrier to good reverse logistics is lack of personnel resources .Lack of training and education is a major challenge to commercial cycling. Education and training are prime requirements for achieving success in any organization (S. K. Sharma et.al, 2011).

2.5.5. Inadequate information and technological systems

An efficient information and technological system is very necessary for supporting the reverse logistics during various stages of the product life cycle. Efficient information systems are needed for individually tracking and tracing the returns of the product, linking with the previous sales. Information technology, software and hardware, is essential for end-to-end control and transparency along the reverse chain (S. K. Sharma et.al, 2011).

2.5.6. Company policies

It also is related to corporate strategy for handling returns and non-salable items. Because companies do not want to see their “junk” cannibalizing their first quality or “A” channel, they often develop policies that make it very difficult to handle returns efficiently, and to recover much secondary value from those returns (S. K. Sharma et.al, 2011).

(Muhammad D Abdulrahman and Nachiappan Subramanian*, 2012), tried to make a summary of challenges faced when implementing RL as presented on table 1.

Table 2.1: various barriers in RL implementation

Barriers	Type of barriers	Source
Management	Importance of reverse logistics relative to other issues	Rogers and Tibben-Lembke (2001); PWC (2008); Zhou *et al*. (2007); Ravi and Ravishankar (2005); Chung and Zhang (2011)
	Company polices	
	Competitive issues	
	Management commitment / little senior management attention	
	Personnel resources (Training, poor level of technical knowledge)	
	Difficulties in extended producer responsibility across countries	
	lack of appropriate performance management system	
	Lack of shared understanding of best practices	
	Lack of strategic planning and structure for reverse logistics	
Financial	Financial resources / Constraints / funds for training / return monitoring system/ storage and handling	Rogers and Tibben-Lembke (2001); Zhou *et al*. (2007); Lau and Wang (2009); Ravi and Ravishankar (2005)
Policy	Legal issues / lack of supportive policies	Rogers and Tibben-Lembke (2001); Zhou *et al*. (2007) Chung and Zhang (2011) ;Lau and Wang (2009); Ravi and Ravishankar (2005)
	Lack of enforceable law / lack of waste management practices	
	Regulations or directives to motivate manufacturers'	
	Customers not informed of take back channels	
Infrastructure	Lack of systems, Underdevelopment of recycling technologies.	Rogers and Tibben-Lembke (2001); Zhou *et al*. (2007); Chung and Zhang (2011); PWC(2008); Lau and Wang (2009); Ravi and Ravishankar (2005)
	Coordination and support / collaboration / reluctance of support from members	
	Limited forecasting and planning/Lack of In-house facilities	

1.6. Ethiopia and the pharmaceutical manufacturing

Although there is considerable interest on environmental implications and waste minimization concerns of the pharmaceuticals industry, RL research in this industry is limited in comparison to other industries (Sushmita A et.al, 2014). Especially in Ethiopia's case the idea of reverse logistics is still considered as extra-curricular activity. Coming to the pharmaceutical industry, it too is at its infant stage.

Local pharmaceutical production in developing countries has always been a debatable issue. On one hand, there are opinions that argue against local pharmaceutical production for lack of comparative advantage, including absence of GMP and inadequate drug regulatory systems. These critics are also concerned with the immediate and long-term threats posed by low-quality medicines manufactured by African countries.

People on the other side of the debate consider essential medicines as strategic commodities and seek to foster self-reliance and hence local production ((Bate, 2008);Tsige et.al, 2016). The Ethiopian industry policy fosters the latter approach. (Tsige et.al, 2016)

The history of pharmaceutical manufacturing in Ethiopia is only half a century old. The first pharmaceutical manufacturing plant in Ethiopia, EPHARM was founded in 1964 as a joint venture by the Ethiopian government and the British company, Smith & Nephew. In 1971, Smith & Nephew was superseded by Teva Jerusalem of Israel. Following the overthrow of the monarchial government by the military in December 1975, the company was nationalized. Today, the Ethiopian pharmaceutical industry consists of 15 pharmaceutical manufacturers, of which nine produce medicines, one manufactures empty gelatin capsules, and the rest are engaged in producing medical supplies such as syringes, absorbent cottons, gauzes, bandages and sanitary products. Though significant expansion of the industry is taking place, as such the base is not yet well developed, and the companies have relatively low production capacities (Tsige et.al, 2016).

The study by (Tsige et.al, 2016) indicates that the local production of medicine only covers 15 percent – 20 percent of the market. Considering the growing population of Ethiopia, grow on the demand of pharmaceutical products as well is expected to increase. Not only that but the growing competition, quality of manufacturing and capacity of other sub-Saharan country pharmaceutical

manufacturers is pushing Ethiopian manufacturers and the government to give emphasis on increasing the local production capacity of pharmaceuticals with a competitive quality.

2.7. CONCEPTUAL FRAMEWORK

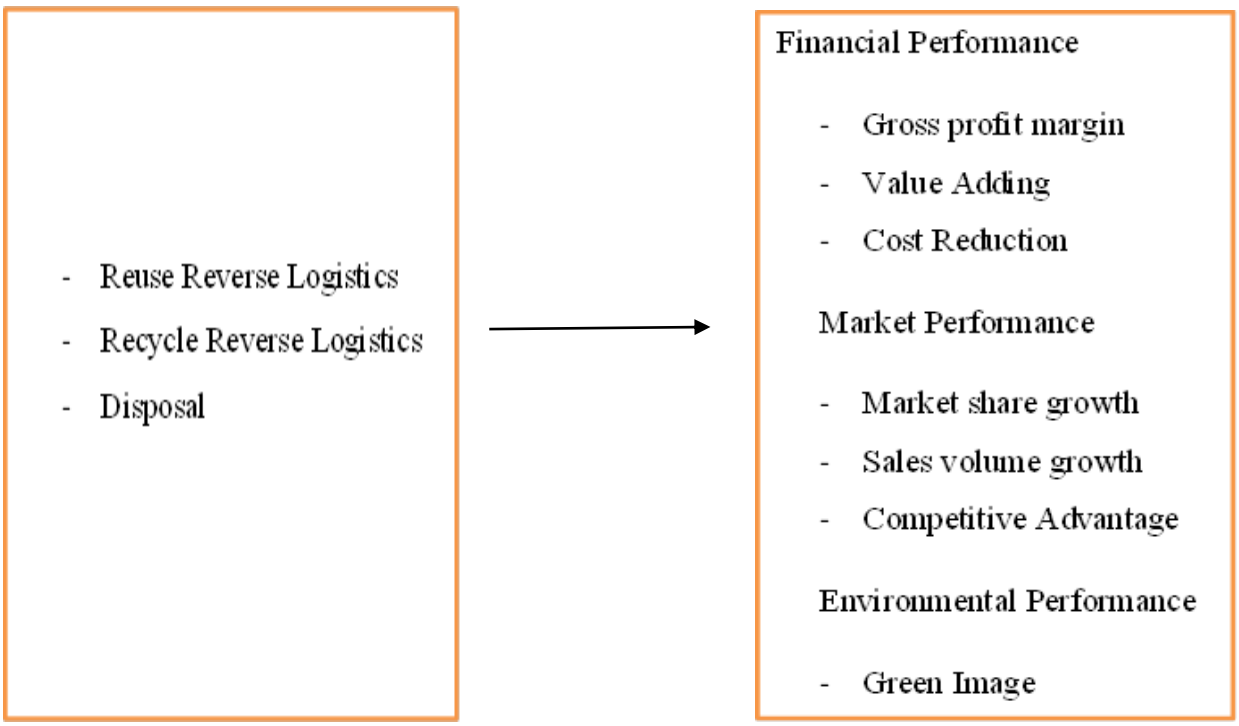

Figure 2.1: Conceptual Framework of the Study

Source: Adopted from (Mogaka, 2015)

Chapter Three

Research design and Methodology

1.7. Introduction

In conducting research, there is the need to gather and collect data by using various tools with the aim of analyzing them into useable information for decision making. It gives enlightenment into how the data gathering instruments are designed, administered and the various methods that will be employed for the data analysis. For clarity purposes, the collected data is organized in line with the major components of the research questions. Applied data collection focuses on participatory, affordable, easy to understand and useful techniques. Information gathering/ data collection and analysis were conducted in close co-ordination and consultation with target respondents and authorities.

Following, the research design, the kind and types of information gathered, data collection techniques used and the analysis system utilized to organize, interpret and present findings are presented.

3.1.1. Research design

The research design of the study is a mix of quantitative method. It describes the reverse logistics practices of Ethiopian pharmaceutical manufacturing companies by studying EPHARM's practices; assess the challenges and opportunities of implementing reverse logistics at EPHARM.

3.1.2. Unit of analysis

The unit of analysis for the case study was EPHARM Share Company which is engaged in manufacturing pharmaceuticals from raw materials in the country.

3.1.3. Data source

The study considered two basic sources of data: primary and secondary data sources. Knowledgeable personalities on the subject, officials of EPHARM considered having particular insight to the issues are considered as the primary source of information. The questionnaires were directed to the mangers or higher officers of technical, production and sales, marketing, and finance departments of the company rather than an individual employee; because it was believed

that the higher officers specifically in this departments have an aggregated thought of reverse logistics practice, the challenges faced with in the company that may enrich the response to the questionnaire relative to an individual employee in the company.

In this study, relevant secondary data related to reverse logistics, its practice, challenges and opportunities were collected from previously written journals, article, books, researches and documents. In addition to the primary data being used to analyze the ongoing situations, data obtained from these sources made the study more reliable and helped to have insights of the theoretical and empirical review of the subject under discussion.

3.1.4. Data gathering tools

In this study, the data collection instrument used is a structured questionnaire distributed to the firm's mangers or higher officials within the firm to collect relevant data. Closed-ended types of questionnaires were prepared for the samples. The questionnaire was slightly modified from a readymade questionnaire that Lilian Moraa Mogaka, 2016 used to study the influence of reverse logistics practices of returned new products on performance of pharmaceutical firms in Nairobi, Kenya. Since it was pre-tested with academics and practitioners to check its content validity, there was no need of conducting pilot test to examine its suitability for the study.

3.1.5. Sampling design and Respondents

For the purpose of the study, the target respondents were team leaders/officers and managers of marketing, finance, sales, production/ technical departments in the company. The departments contain 32 staff members in which it makes the population manageable so there was no sampling needed.

3.1.6. Data analysis

After the completion of data collection, data entry and data cleaning for this study; the researcher used Descriptive analysis using Statistical Package for Social Science (SPSS) to get the required data analysis results for the study. Then results were presented by using charts, tables and different kinds of statistical data presentation techniques to show respondents position on the practice of reveres logistics in the company, the challenges faced and opportunities of the future.

And according to the analysis result were inferred with statistically accepted inferences by giving the answer for those research questions raised in the study.

3.1.7. Ethical consideration

Obeying ethical rules is vital in conducting research. The researcher distributes the questionnaire with introductory letter stating the purpose of the filling out the questionnaire and ensuring the respondent the information obtained will be kept confidential and anonymous. Letter of permission has been secured from Addis Ababa University, School of Commerce that enabled the researcher to carry out the research and approach the informants. Participant of the study were informed about the objectives of the study emphasizing that the data will be used only for the intended academic purpose. The data were collected with the consent of the participants of the study. Careful attention was taken with regarding respecting the rights, needs and values of the study subjects, and maintaining confidentiality of the data and acknowledging sources of information.

Chapter Four

Results, Discussion and Interpretation

1.8. Results/Findings of the study

4.1.1. Introduction

In this part data that were collected using questionnaires and document review are presented. The data was vital to investigate the RL practices of EPHARM, challenges related to the reverse logistics and to forward recommendations based on the identified findings. The data was collected from Finance division, technical/Production division and marketing and sales division of EPHARM Share Company. In addition, document is reviewed to assess some of the reverse logistics practices of the company.

The results are organized as follows.

4.1.2. Section A: General information

The study targeted on 32 respondents which are 11 respondents from marketing and sales division, 10 respondents from finance division and 11 respondents from technical/production division which makes it a total of 32 respondents. But only 27 questionnaires were returned which makes 85 % of response rate.

4.1.2.1. Gender of respondents

Table 4.1, tries to summarize the gender combination of the respondents.59.3% of the respondents were male and 40.7% of the respondents were female respondents.

Table 4.1., Gender of respondents

	Frequency	Percent
Male	16	59.3
Female	11	40.7
Total	27	100.0

Source: Primary Data, 2016

4.1.2.2. Level of Education of Respondents

The second question respondents were asked was their education level. From the 27 respondents 22 of them which are 81.5% of the respondents were degree holders while 5 of them or 18.5% of the respondents were diploma holders.

Table 4.2., Level of Education of respondents

	Frequency	Percent
Diploma	5	18.5
Degree	22	81.5
Total	27	100.0

Source: Primary Data, 2016

4.1.2.3. Current position of respondents

The third question of the study was the current position of respondents. 11 questionnaires were given to the finance department but only 9 were filled and returned which makes it 33.3%, 11 questionnaires were given to the marketing and sales department as well but only 10 were filled and returned which makes it 37% and 10 questionnaires were given to the technical/production department but only 8 were filled and returned which makes it 29.7% of response rate.

Table 4.3.Current position of respondents

Department	Number	Percentage
Finance	9	33.3%
Marketing and sales	10	37%
Technical/Production	8	29.7%

Source: Primary Data, 2016

4.1.2.4. Duration of Employment

The respondents were asked to indicate length of time they had served the company. The findings in Table 4.4 indicate that 40.7% of the respondents had worked between 3-5 years, 25.9% of the respondents had worked between 6-10 years and 11.1% of the respondents had worked above 10 years indicating that the respondents are familiar with the operations of the firms.

Table 4.4.Duration of Employment

	Frequency	Percent
<2 Years	6	22.2
3-5 years	11	40.7
6-10 years	7	25.9
>10 years	3	11.1
Total	27	100.0

Source: Primary Data, 2016

1.8.1.5. Duration of Establishment of RL Practice

The respondents were asked to indicate the number of years their firms have established reverse logistics practices from the options provided.88.9%of the respondents confirmed that EPHARM had established reverse logistics practices for more than 6 years. This indicates that the company has realized the importance of putting measures in place to handle reverse logistics.

Table 4.5.Duration of Establishment of RL practice

	Frequency	Percent
4-6 Years	3	11.1
> 6 years	24	88.9
Total	27	100.0

Source: Primary Data, 2016

4.1.3. Section B: extent of adoption of RL practice

The implementation of reverse logistics helps a company achieve their economic and social goal. In order to take back returned products, a company should establish handling mechanism of this returned products. The most known reverse logistics procedures are reuse, remanufacture, recycle and dispose. Firms should know and decide which reverse logistics practice to use in a way they can minimize the cost of return handling and maximize the benefit they can get as much as possible. And most of all their concern must be on how to preserve the environment from this unused, unfit or unwanted medicines, because in the case of pharmaceuticals if not handled properly can cause a serious damage on society environment etc……

The study sought to establish the extent to which EPHARM share company has adopted RL practices A 5 point Likert scale was used to rate the extent of adoption of reuse, recycling and Dispose RL practices, with 1 indicating "not at all", 2 "to a small extent", 3 "to a moderate extent", 4 "to a large extent" and 5 "to a very large extent". The results are presented in the Table 4.6

Table 4.6: Extent of Adopting RL Practice

	N	Mean	SD
1. Reuse			
- Set quality standards for reuse	27	3.9259	.67516
- Design products for reuse	26	2.9615	.91568
2. Recycling			
- A well-documented policy for recycling	27	1.4074	.74726
3. Dispose			
- Landfill	26	4.3846	.63730
- Throw to trash	26	3.3077	1.19228
- Incinerate	24	1.2500	.89685

Source: Primary Data, 2016

From the data collected, majority of the respondents indicated that the company implements dispose reverse logistics specially landfill as indicated by a mean score of 4.08 and 4.3 respectively. Taking returned products in to trash also showed a significant mean score of 3.3 and 9of the respondents indicated that returned products with no chance of reuse are buried. Reuse reverse logistics by setting high quality standards was also highly practiced scoring 3.9. Designing products for reuse scored a mean score of 2.9, while majority of the respondents indicated that their firm did not use recycling reverse logistics or have well documented policy for recycling or if they did, it was to a small extent, with a mean score of 1.4. The data collected indicated that the firm does not use incinerator to dispose returned products or it is to a very little extent with a mean score of 1.25 which was the lowest score. The result indicates that EPHARM's practice of reverse logistics is limited. This is because most of the procedures are done using labor intensive, step by step manual system. Though it is obvious using incineration for disposing of returned products is a better way of handling, the results show that the company uses landfill, throwing to trash and burying of unused medicine. This is an indicator that the company is not supported with relevant technology that encourages better performance and assures sustainability. From the result we can see that the company's focus on recycling is very low. To reduce the cost from returned products and salvage any raw material from the returned product enough consideration must be given to recycling reverse logistics. This will help reduce the cost of raw materials, reduce disposal of useful ingredients etc…

N.B. There were missing values, 1 from designing products for reuse, 1 from recycling reverse logistics practice and having a well-documented policy for recycling, and 1 value was missing from disposal reverse logistics, landfill, throw to trash and 3 values were missing from incinerating.

4.1.4. Section C: Drivers of adopting RL practice

Reverse logistics has become a significant matter for companies all over the world for different reasons like economic benefits, market share growth obligation to legislation and environmental consciousness. Typically, competitive, marketing, economic and environmental reasons are all factors that have been identified as relevant for the organizational adoption of RL activities and functions ((Ravi and Shanker, 2005); Sushmita A. et.al, 2014). For businesses, direct (cost

reduction, value added recovery and input material) and indirect gains (anticipating impending legislation, market protection, green image, improved customer/supplier relations) are economic drivers. A second type of drivers is legislation related, as there is an increase in environmentally related legislation.

The study sought to establish the drivers for implementing reverse logistics practice at EPHARM Share Company. A 5 point Likert scale was used to rate the extent of adoption of reuse, recycling and Dispose RL practices, with 1 indicating "not at all", 2 "to a small extent", 3 "to a moderate extent", 4 "to a large extent" and 5 "to a very large extent". The results are presented in the Table 4.7.

Table 4.7: Drivers for Adopting RL Practice

	N	Mean	SD
1. Economic			
- Cost reduction	27	3.5185	1.15593
- Gross profit margin	27	3.5926	.97109
- Value adding	27	4.3333	.91987
2. Market			
- Market Share Growth	27	3.9630	.75862
- Sales volume	27	3.5556	1.01274
- Competitive Advantage	27	4.7037	.60858
3. Environment			
- Green Image	27	4.8519	.45605

Source: Primary Data, 2016

From the data collected, majority of the respondents indicated that the driving forces for the company to implement reverse logistics are Economic with a mean score of 3.6 specially value adding with a mean score of 4.3. Market has a significant role especially competitive advantage as well indicated with a mean score of 4.00 and 4.7 respectively. Great number of respondents indicated that the major reason for implementing reverse logistics is the environmental aspect/ green image of the company with a mean score of 4.8.

The first driver considered in the study was the economic benefits. From the collected data respondents with a mean score of 3.6 believe that reverse logistics implementation brings significant economic benefits. To briefly understand this economic benefits, the study tried to rate more elaborate economic benefits. Respondents rated cost reduction economic benefits from implementing reverse logistics with a mean score of 3.52, increase in profit margin was scored with a mean vale of 3.59 and value adding was rated 4.3, from this we can conclude that even though implementing reverse logistics is low at cost reduction according to respondents it has a significant role in increasing gross profit margin and mostly from value adding which insures sustainability.

The second driving force considered in the study was the market benefit of implementing reverse logistics. From the result we can see that reverse logistics has a great impact on the company's market, which is expressed with a mean score of 4. Marketing benefits were further elaborated into market share growth, sales volume growth and competitive advantage. Respondents rated competitive advantage with the highest mean score of 4.7. from this results it can be inferred that though implementing reverse logistics plays a significant role on market share growth and sales volume growth its strongest impact is shown on competitiveness within the market which in another way indicate a market share growth and sales volume growth as well.

The third indicator considered in the study was environmental benefits. For any business to stay functional and set a value system within its customers, sense of corporate citizenship or environmental consciousness is without a doubt very significant. Respondents view towards environmental benefits holds the same. Respondents with a mean score of 4.8 agreed that implementing reverse logistics will increase the green image of the company within its customers.

From the data collected, majority of the respondents indicated that the driving forces for the company to implement reverse logistics are Economic with a mean score of 3.6 specially value adding with a mean score of 4.3. Market has a significant role especially competitive advantage as well indicated with a mean score of 4.00 and 4.7 respectively. Great number of respondents indicated that the major reason for implementing reverse logistics is the environmental aspect/ green image of the company with a mean score of 4.8.

These results in another word show that implementation of reverse logistics practice affect all the mentioned driving factors for adopting reverse logistics. Since Ethiopia's pharmaceutical manufacturers competition is mostly not with each other but with imported products, reverse logistics practice gives them a better barraging power to impress local distributers and wholesalers.

4.1.5. Section D: challenges of implementing RL practice

When talking about challenges faced in implementing reverse logistics, a lot can be said especially in developing countries like Ethiopia. Lack of awareness, management inattention, Lack of technology, personnel resource, financial constraints and company policy are some of the many challenges that can be mentioned.

The study sought to establish the challenges faced by EPHARM Share Company when adopting RL practices. A 5 point Likert scale was used to rate the extent of adoption of reuse, recycling and Dispose RL practices, with 1 indicating "not at all", 2 "to a small extent", 3 "to a moderate extent", 4 "to a large extent" and 5 "to a very large extent". The results are presented in the Table 4.8.

Table 4.8.: Challenges of implementing RL practice

	N	Mean	SD
1. Lack of appropriate technology	27	3.8889	.97402
2. Lack of appropriate infrastructure	27	3.7407	1.09519
3. Lack of definite rules and regulations on handling returned products	27	3.5556	.93370
4. Costly to manage reverse logistics	27	3.8889	.89156

Source: Primary Data, 2016

From the findings on Table 4.8., majority of the respondents cited lack of appropriate technology in implementing reverse logistics practices as the major challenges with a mean score of 3.9 and a standard deviation of .97.Managing cost of reverse logistics had a mean score of 3.9 as well with a standard deviation of .89 while lack of appropriate infrastructure had a mean score of 3.7 with a standard deviation of 1.09. Lack of definite rules and regulations on handling returned products had the least score with a mean of 3.5 and a standard deviation of 0.93.

The findings show that large number of respondents believe lack of appropriate technology is a pull back for reverse logistics practice to take place within the company. EPHARM Share Company being the first and the oldest pharmaceutical company in Ethiopia, and being government owned its technological capacity can be said very low. Especially when it comes to reverse logistics, up to date technology is very low. We can refer to the first section of the study, extent of adoption of reverse logistics to support this fact. The company uses old school return handling because it lacks the technology the system needs. The second indicator, lack of appropriate infrastructure also goes with the lack of technology. Modern technology is not just limited to high tech machineries and equipment but a well-built infrastructure to implement reverse logistics. These could be training of employees, having a reverse logistics system that is easily understood and appropriate equipment needed. All in all it involves creating a system that fosters the implementation of reverse logistics. The other major factor respondents indicated was the cost management in implementing reverse logistics. It's obvious that implementing reverse logistics involves cost. But what companies should consider is that it's about choosing the right reverse logistics practice appropriate for the company so that the company manages or reduces the cost to its minimum. Last but not list lack of appropriate rules and regulations on handling returned products is amongst the challenges of implementing revere logistics practice. FMHACA and WHO in collaboration developed a five year road map on GMP compliance since December, 2015. But mostly it is on paper and the specific directives and implementation procedures are on process. This lack of defined rules and legislations gives a chance of negligence towards the handling of retuned products. There needs to be a legislation that encourages and at the same time enforce certain rules and regulations on handling reverse logistics.

4.1.6. Section E: Opportunities of implementing RL

Even though all the respondents didn't give their opinion about what the future holds for EPHARM' reverse logistics practice, opportunities there are, the researcher tried to fill in the gap with published documents of the company. EPHARM was privatized and now it is one of the MEDITECH families. Though it is with low capacity compared to EPHARM the company owns Julphar Pharmaceutical manufacturing Ethiopia plc., which was established in 2013 working in alliance with the United Arab Emirates (UAE) company, Gulf Pharmaceuticals (Julphar) which has an establishment that fulfills GMP requirements. "We are moving forward to put the factory in a manufacturing line catching up with the dictates of GMP and to make it more competitive in

the international market. We have a plan to install an edifice which is well equipped to meet GMP, on the tract of land granted for expansion. We will also create an enabling atmosphere to equip employees with knowledge and skill required inviting well acclaimed professionals from abroad" says Dr. Mohammed Nuri, managing director of MEDTECH Ethiopia and Chairperson of EPHARM's board of directors (EPHARM, 2014). MEDETCH was established in 1998 as an importer and distributer of medical supplies. In the last few years the company grew into medical manufacturing as mentioned above. Given the above statement it is clear that EPHARM is going under changes which gives it an opportunity of using high technology for production, a great chance of building infrastructure for handling retuned products and meet the GMP and government requirements on handling returned products minimizing the cost and enjoying the benefit of reverse logistics practice.

EPHARM was granted a 40,000sqm land at Sebeta town, in which a GMP compliant factory is about to be built in. the other opportunity is that the new owners of the company have the experience of working together with an international pharmaceutical company and they have a system of experience sharing, training and capacity building programs which will be handy in upgrading the awareness of EPHARM's staff. This experience is believed to help improve the information system as well. Having a communication system between the distributers and the manufacturer allows reduce the amount of product return as well trace and track reasons for recall. It will also encourage distributers to choose the company among others when its easy to communicate and work hand in hand.

The future has a great opportunity to invest in pharmaceuticals since the government is giving emphasis to local manufacturing of pharmaceuticals to fulfill not only the local market but to be able to engage in the international market as well.

Chapter Five

Summary, Conclusion and Recommendations

5.1. Introduction

This study was carried out to determine the extent to which EPHARM Share company have adopted reverse logistics practices, the drivers for implementing reverse logistics practice with in EPHARM Share company and to establish the challenges faced in implementing reverse logistics practices as well future opportunities of implementing reverse logistics. This chapter presents the summary of findings, conclusions, recommendations and suggestions for further research.

5.2. Summary of findings

The summary of findings covers general questions like respondent's bio data, extent of adoption of reverse logistics practices, driver of reverse logistics with in EPHARM Share Company and challenges faced in implementing reverse logistics practices.

5.2.1. Respondent's bio data

Out of the 32 questionnaires, 27 were returned representing a 84% response rate. The study established that the company has implemented reverse logistics for more than 6 years.

5.2.2. Extent of adoption of RL practices

Adoption of reverse logistics basically means the process of implementing a structure of return handling for the purpose of sustainability and competitive advantage with in the market. It involves reuse, recycling, remanufacturing and disposal of end of use products.

The findings showed that disposal reverse logistics specifically taking waste to landfill had the highest mean score of 4.3, setting quality standards for reuse had a mean score of 3.9 while designing products for reuse scored a mean of 2.9.Majority of the respondents cited that their firms did not have well documented policy for recycling scoring a mean of 1.4. This result implies that even though the company has established a reverse logistics practice it is at a low level and with poor technological advancement.

Objective 1; Review the reverse logistics practice of EPHARM

The first objective this study aimed to achieve was to review the practice of reverse logistics practice of EPHARM Share Company. From the findings it can be seen that the company practices disposal reverse logistics. The higher score goes to taking waste to landfill and throwing to trash. Another reverse logistics practice the company uses with a major score is reuse reverse logistics practice by setting quality standards for reuse. From the score we can infer that the company does not use recycle reverse logistics practice nor has a well-documented policy for recycling.

5.2.3. Drivers for implementing RL in EPHARM Share Company

There are several reasons for implementing reverse logistics within company. Several researches show that basic or predominant reasons for implementing reverse logistics are Economic, Social/ corporate citizen ship and legislation. The finding tried to explain the drivers of reverse logistics practice from three dimensions. The first one is economical drivers which were given high score of 3.6. The results show that implementing reverse logistics help increase gross profit margin with a mean score of 3.6, reduce cost with a mean score of 3.5 and the highest score concerning reverse logistics practice economical driver is value adding with a mean score of 4.3. The second driver is market with a mean score of 4 represented by market share growth with a mean score of 3.9, sales volume with a mean score of 3.5 and competitive advantage with a mean score of 4.7. The last driver considered in this study was environmental driver which had the highest mean score of 4.8 which was represented by green image also with 4.8 mean score. The results from the finding imply that economically the company can benefit from RL practice by value adding and increase in profit margin. Market share growth and competitive advantage are as well benefits that can be achieved from RL practice. The finding shows that environmental sustainability expressed through green image plays a vital role for companies to extend their responsibility.

5.2.4. Challenges of implementing RL practices

There are certain challenges involved in implementing reverse logistics though there are few researches done in the area. Lack of appropriate technology, lack of infrastructure, lack of

defined rules and regulations on handling returned products and managing the cost of handling RL are the most known challenges.

From the data collected, it was clear that there were challenges faced by the firms in implementing reverse logistics with majority of the respondents citing lack of appropriate technology in implementing reverse logistics practices and considering reverse logistics practice as a costly procedure as the major challenges. Pharmaceutical firms therefore need to allocate more resources in improving their reverse logistics capabilities.

The finding on this study is no different from the researches mentioned in the literature review.

Objective 2; Review challenges involved in reverse logistics practice

As it is mentioned on the above paragraph challenges the company faced are mostly of lack of appropriate technology, considering reverse logistics costly take the major place and lack of appropriate infrastructure and lack of definite rules and regulations on handling returned products follow.

5.2.5. Opportunities of implementing RL

Objective 3; From the study it is indicated that EPHARM has an opportunity of improving its machineries and its working system with up to date technologies, since the company is working to achieve the GMP requirements it helps the company improve its infrastructure for reverse logistics practice. Last but not least government engagement in helping manufacturers improve their way of working as well since rules and regulations of meeting the standards of GMP are on the way of being published, which has clear conditions on how to handle returned products are major opportunities.

5.3. Conclusion

Competition between companies these days is not limited to manufacturing and just giving products to the forward chain but it requires firms to have outside the box thinking in order to gain the heart of their customers. Supply chain is a contemporary issue that is playing a great role in easing the communication between the manufacturer, distributer and end user. Still the forward communication between the stack holders is not enough because in case of unfit, unused

or over stocked product, this forward chain needs to have a system of going back. Based on these facts, for firms to implement reverse logistics practice has come to the point of being critical.

The purpose of this research was to investigate the RL practices of Ethiopian pharmaceuticals manufacturing companies. Based on the findings the following conclusions are drawn. From the data collected, it was concluded that;

EPHARM Share Company has adopted reverse logistics practices with reuse and Dispose reverse logistics being predominant. But still we can conclude that the reverse logistics practice is at its lowest stage. This is because of different challenges like low technology, lack of appropriate infrastructure as well lack of defined rules and regulations of handling returned products and most of all the fact that management considers reverse logistics as a costly procedure. Pharmaceutical firms can face the challenges of implementing reverse logistics by investing to improve their technology, infrastructure and believe that the cost that will be incurred will bring impressive return for a longer period of time.

It was also concluded that the drivers for implementing reverse logistics practice are mostly value adding, competitive advantage and green image. As articles from the literature review explained implementing reverse logistics plays a great role on the economic, market and environmental performance of any company. The findings in the study as well show that the driving factors for implementing reverse logistics practice at EPHARM are the same as the literatures above mentioned. Especially in the case of EHARM share company respondents believe that implementing reverse logistics lays a great role in value adding, competitive advantage and green image. Increase in marginal profit, cost reduction, market share growth and increase in sales volume also have some extent of contribution.

Lastly the study concluded that EPHARM Share Company has a great opportunity in the future to implement a better and sophisticated reverse logistics practice with a better infrastructure and technology. From the findings on the study we can learn that EPHARM Share Company, being privatized has a chance of building a better facility with good technologically advanced machineries, create improved man power by sharing experience from other pharmaceuticals abroad.

5.4. Recommendations

Based on the conclusions of the study the following are recommended. As it has been continuously said companies can no longer consider reverse logistics practice as an extra procedure. Especially in the pharmaceutical industry there needs to be a greater emphasis. This is because if unfit, expired or unwanted pharmaceutical inters the market in an unlawful way its consequences risk human life.

Considering this facts the study recommends that EPHARM Share Company should invest in appropriate technology for their reverse logistics processes such as having codes that can be used to track reason for each return, establish a system in which distributes are involved and work towards eliminating the root causes for the returns. Another way to improve its technology is using high tech machineries lick incinerators for disposal of pharmaceuticals that have no chance of recovery. For those which have the chance to be recycled or those that have some components that can be salvaged should be handled using the available and up to date technology. This can be achieved by gaining senior management support on reverse logistics practices through raising awareness and trainings of its importance at senior level and to employees to raise awareness of reverse logistics practices across board facilitating its implementation. Since the new owners of EPHARM Share Company have experience in the pharmaceutical industry and they also have the experience of working with companies abroad with a good profile.

EPHARM Share Company should consider developing detailed disposition strategies for the returned products, handling system and as it has been mentioned above use high technology for disposition of returned products so that costs of returns to be able to manage the cost of returns to bare minimum. Lastly, EPHARM should embrace a continuous improvement policy that will involve putting key performance indicators in place to assess progress in implementing reverse logistics practices and take the benefit of opportunities it has to establish a better reverse logistics practice. Ethiopia is a country with a fast growing population which means with a growing need for healthcare and pharmaceutical availability. The pharmaceutical manufacturing industries in Ethiopia are few in number and with weak production capacity. So the responsible party who is in charge of facilitating and fostering a better climate for investors to be attracted to invest in local manufacturing of pharmaceuticals should work hard on encouraging investors. In line with

doing that existing and new coming manufacturers should be encouraged to produce products with international quality using high technology, quality information system and skilled man power. Further, more the guideline for manufacturing, recall handling and related issues should be prepared and be available for everyone to be able to refer.

5.5. Suggestion for future work

- Studies that are done to assess the practice of reverse logistics within the pharmaceutical industry should be done throughout the country. Not only within pharmaceutical industry but further researches must be done in the practice of reverse logistics in the context of Ethiopia.

- Studies that deeply address the financial and social benefits of reverse logistics practice should be done within the context of Ethiopia.

- Studies that can assess costumers feeling towards the reverse logistics practice and what effects it will have towards customer satisfaction should be done.

Reference

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ANNEX I

Addis Ababa University

School of Commerce

MA program in Logistics and Supply chain Management

Acknowledgement to the respondent

I would like to express my gratitude to your dedicated cooperation/had it not been to your genuine cooperation of completing this Questionnaire, it would have been impossible to conduct the research.

I am Rediet Dembi from Addis Ababa University, School of Commerce. This questionnaire has been designed for collecting data on prospects and challenges of implementing reverse logistics in pharmaceutical firms specifically in EPHARM. The research intends to find out the extent to which EPHARM has adopted reverse logistics practices, the challenges faced in doing so and what future opportunities there are. Information obtained will be treated with high level of confidentiality and will be used for academic purposes only.

Dear respondent, your participation is completely voluntary and I can assure you that the information obtained will be kept confidential and anonyms. Completion of this survey constitutes your informed consent to participate in the study. Your participation will be highly appreciated.

Section A: General Information

1. Gender Male ☐ Female ☐

2. Level of Education

Certificate ☐ Diploma ☐ Degree ☐ Post Graduate ☐

3. What is your current position in the company? _____?

4.

5. How long have you worked in the company?

Less than 2Years ☐ 3-5years ☐ 6-10 years ☐ More than 10years ☐

6. How long has your firm established reverse logistics practice?

Not yet ☐ up to 3years ☐ 4-6years ☐ more than 6years ☐

Section B: Extent of adoption of reverse logistics practice

7. Indicate the extent to which your firm has adopted the following reverse logistics practices by ticking the appropriate box using the following scale:

I=Not at all II=Small Extent, III=Moderate extent, IV= large extent, V=Very large extent

Reverse logistics practice	**I**	**II**	**III**	**IV**	**V**
1. Reuse					
- Set quality standard for reuse					
- Design products for reuse					
2. Recycling					
- A well-documented policy for recycling					
3. Dispose					
- Land fill					
- Throw to trash					
- Incinerate					
- Others (Specify)					

Section C: Drivers for Adopting Reverse Logistics Practice

8. Indicate the extent of the drivers for adopting reverse logistics practice in your firm by ticking the appropriate box using the following scale:

I=Not at all II=Small Extent, III=Moderate extent, IV= large extent, V=Very large extent

Drivers	**I**	**II**	**III**	**IV**	**V**
1. Economic					
- Cost reduction					
- Gross profit margin					
- Value adding					
2. Market					
- Market share growth					
- Sales volume growth					
- Competitive advantage					
3. Environment					
- Green image					
Others (Specify)					

Section D: Challenges of Implementing Reverse Logistics Practice

9. To what extent are the following challenges experienced in your firm when implementing reverse logistics? Indicate your answer by ticking the appropriate box using the following scale:

I=Not at all II=Small Extent, III=Moderate extent, IV= large extent, V=Very large extent

Challenges	**I**	**II**	**III**	**IV**	**V**
1. Lack of appropriate technology					
2. Lack of appropriate infrastructure					
3. Lack of definite rules and regulations on handling returned products					
4. Costly to manage reverse logistics					
5. Others (Specify)					

Section E: Opportunities of implementing reverse logistics

10. What opportunities do you think the future holds to your firm for improving and adopting reverse logistics practice in your firm?

_____

_____

_____

Please indicate any other relevant comments

_____

_____

_____

_____.

Thank you for participating