The Assessment of Reverse Logistics on Plastic Manufacturing Companies Located in Addis Ababa

By

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DECLARATION

I, Tsega biru hereby declare that this study entitled; assessment of reverse logistics on plastic manufacturing companies in Addis Ababa is my own work. All information in this document has been obtained and presented in accordance with academic rules and ethical conduct. This study has not been submitted for award of any degree or diploma program in this or any other institution and, I have fully cited, acknowledged and referenced all material and results that are not original to this work.

Confirmation

This is to certify that Tsega Biru has carried out this research work on the topic entitled "Assessment of reverse logistics on plastic manufacturing companies located in Addis Ababa" under my supervision. This work is original in nature and has not been presented for a degree in any university and it can be submitted for the partial fulfillment of the requirements for the award of the degree of Masters of Art in Logistics and Supply Chain Management.

BirhanuDenu (Ph.D.)

Signature_____

Date_____

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ELV: end of life vehicles directive

EOL: end of life

GARS: Global asset recovery (service)

WEEE: waste electronic equipment

RL: reverse logistics

ROHS: restriction of use of certain hazardous substances directives

ABSTRACT

Reverse logistics is an important process that is often misunderstood. Many organizations do not understand what processes and procedures to follow and how to manage reverse logistics efficiently. The aim of this study is to assess reverse logistic practices in plastics manufacturing companies located in Addis Ababa.To address this study descriptive analysis method was employed. To gather data for the study questionnaire and interview have been used. The analysis was depending on the data obtained from the different respective organization like ministry of trade.Data analysis is by using SPSS (Statistical Package for Social Sciences) to explain, understand and summarize the data that will be collected. Descriptive statistics like mean, frequency and percentile to analyze respondent background and related issues.

CHAPTER ONE

1. Introduction

The aim for conducting this study is that Reverse Logistics is a relatively new unrecognized field, especially in Ethiopia, and only few organizations really understand the benefit and importance of reverse logistics. This study intends to look at the assessment of reverse logistics on plastic manufacturing Companies, Addis Ababa.

1.1. Background of the study

Currently the usage of plastics is increasing due to their convenience and reliability for packaging materials. Significant numbers of consumers of bottled water in Addis Ababa prefer to use bottled water for drinking at home, work places or hotels as compared to other forms of tap water. Using plastic bottles for water and soft drinks increases the marketability and quality of the products through ease of access to simply pick and drink everywhere when needed.

The overall logistics performance can either constrain or enhance the performance of the organization. And hence accordingly impact the economic performance of a country. The high proportion of an improved and efficient logistics performance across various industries of an economy can contribute to increase their production efficiency and thus improve their competitiveness in international market. Also at firm level, excellence in logistics is related to higher organizational performance (Fugate et. al, 2010:53 Keebler and Plank, 2009:795 Green Jr et. al, 2008and Mansidao and Coelho, 2014:4).

In a world where quality holds paramount important, the attitude towards forward logistics has evolved to include enhancement of customer service quality. Meanwhile growing concern for environmental problems and pressure from the global competitive marketplace toward further improvement of customer service have been presenting industries a new challenge of development and management of effective reverse logistics process (Horowitz 2010:1).

Reverse logistics is an important process that is often misunderstood. Reverse logistics can cause considerable cost, but provide numerous opportunities. Many organizations do not understand

the correct process and procedure to follow and how to manage reverse logistics efficiently. According to (walker, 2010) logistics can be defined as "A function responsible for all movement of materials through the supply chain." A definition for supply chain management from (walker, 2010) is "A supply chain is a serious of activities and organizations in which materials both tangible and intangible-move through on their journeys from initial suppliers to final customers. A reverse logistics is expanded from the knowledge of supply chain management (walker et al 2010).currently; one of environmental issues that are gaining center stage is waste management. In addition with the growing concern for the environment and the need to use materials efficiently and effectively, reverse logistics is gaining recognition worldwide in business as well as research (Wang, Zhou and Ren, 2010).

Reverse logistics is a process where a manufacturer accepts previously shipped products from the point of consumption for possible recycling and re-manufacturing (Fortes, 2009). It is the process of retrieving the product from the end consumer for the purposes of capturing value or proper disposal. Activities include collection, combined inspection/selection/sorting, re-processing/direct recovery, redistribution, and disposal (Ninlawan, Seksan, Tossapol & Pilada, 2010).

A growing concern to durable product manufacturers is how to manage the products they manufacture once they reach their end of life (EOL) (Toffel, 2004). Reverse logistics sometimes referred to as "product take-back" is one of the concepts in the wider concept of Green Supply Chain Management (GSCM) that is seen as a possible solution to this. The disposal of products is no longer a responsibility undertaken solely by its consumers. This is mainly due to a number of legislative, environmental, and economic reasons. Stringent packaging and environmental regulations are driving companies to be more accountable for residual products and also the final products, even after product sale. When firms investigate the re-manufacturability, reusability, and recyclability of their products then there will be fewer disposals. Fewer disposed products can benefit companies and the environment (Rogers & Tibben-Lembke, 2001). Conceptually, reverse logistics can promote alternate uses of resources that can be cost effective and ecologically friendly by extending products normal life cycles (Melbin, 1995).

Organizations give importance to reverse logistics aspect mainly due to three reasons (Srivastava & Srivastava, 2006) the growing importance of environmental issues and their impact on public opinion (De Brito, Dekker & Flapper 2005), the benefits that the company gains by improving their return processes such as image enhancement, improved market share, it allows getting new profits (Stokes & Clegg, 2002; De Brito et al., 2005) and the new and growing environmental regulations (Stokes & Clegg, 2002; De Brito et al., 2005).

A key performance indicator is a quantifiable measure a company uses to determine how well it meets the set organizational goals. Using financial indicators in business performance measurement allows an organization to compare different business types. An organization can define its own operating objectives and use them to evaluate their performance. Some of the measures it can use include: Activity ratios evaluate how efficiently the company manages its business. According to Paul & Anantharaman (2003) the most important of the organizational performance are to achieve higher performance or maximization of wealth for the shareholders. Performance also as the ability of an object to produce results in a determined a priority, in relations to a targets or goals (Laitinen, 2002).

The disposal of empty bottles by bottled water users anywhere on the streets of the city is environmentally unfriendly as all of the packaging of the bottled water is plastic. In the absence of green packaging of water products for commercial use in Ethiopia, it demands for reverse logistics process on used water and soft drink plastic bottles in Addis Ababa citylogistics for recycling of plastic packages for use (Matiwos Ensermu, 2014).

Reverse logistics here is the back ward collection of used plastic bottles from the consumers to the recycling centers or the company for recycling or reusing purpose. There are some practices to collect and recycle plastic bottles in Addis Ababa city but it is accompanied with problems on separation, collection, transportation, storage and recycling of empty plastic bottles.

1.2. **Statement of the problem**

There are major barriers and obstacles, which make managing reverse logistics effectively and proactively difficult (Thierry and Salomon, 1995).for this reason many organizations tends to ignore reverse logistics functions and regard them as nuisance (Shannon, 1995).

Several researches and study has been done in different parts of the world on the area of reverse logistics from the word reverse logistics we can understand that there are different components and parts can be used again. It's obvious that not all materials have the same character and flexibility. This means that every material and products have their own texture which describes the composition of the products. Which implies some of the products can be decomposed easily and friendly with the environment when proceeding to the other type of products it could take a few decades to be decomposed thus cannot be easily friendly with the environment. That is why the concept of reverse logistics is needed now a day in order to make them usable again.

In well developed countries this kinds of problem is no longer there problem it is under control of their technology they can produce any kinds of products by using different types of chemical with the composition of ingredients to bring the required and the desired products. After all it is going to be used again after some process in reverse logistics. Unlike developed countries in the developing countries it is difficult to find satisfactory level of reverse logistics practices. Even the word reverse logistics might not be known. But now day's different organizations are realizing the benefit of reverse logistics and trying to make the products usable again in some way.

Although there are different studies conducted on the area. For instance reverse logistics and network design and analysis connecting with recyclable materials Implementation of recovery strategies such as recycling, reuse, and remanufacturing polices are now becoming a competitive advantage to address environmental and resource scarcity problems. In order to implement this polices, appropriate logistics structures/network design is considered as a strategic plan. This includes obtaining an optimum number and location for the facilities involved, capacity and resources needed for facilities.

The main idea is that before the reverse logistics practice there should be appropriate structure network design strategic weapon should be available. The other study is reverse logistics on used water and soft drinks plastic bottle specifically in relation a survey had been done which is done by (matiwos ensermu, 2014) shows the implication of reverse logistics on bottled water manufacturing in Ethiopia finally he recommended that there should be legal enforcement by the law for the environment sustainability.

Solid waste in general is the main problem affecting the environment and good looking of the city. One of the challenges for sanitation problems and environmental impacts in the city is used plastic which is not properly handled after use and increasingly used from time to time. Since logistics in general and reverse logistics is young discipline in Ethiopia there is a research gap in assessing the reverse logistics performance in the country and this made preferable to conduct thesis on reverse logistics generally on plastic manufacturing companies as a whole. Thus as it is stated above different studies are conducted some of them are focusing on measuring the performance of the system of reverse logistics the other is investigation on the network design of reverse logistics on recyclable materials therefore appropriate and efficient survey on how many of the organization in Addis Ababa are using the practices of reverse logistics on manufacturing products and how many of the companies are not engaged on the process and it's not only that what are the advantages gaining by having the practice and at the same time companies who are not involving in the practices are they disadvantageous or they have nothing to lose to answer such kinds of questions and finally to have a conclusion and give recommendation on it. The need for this research is arise from this perspective.

1.3 Research Questions

1. What is the role and social responsibility of plastic manufacturing companies in protecting the environment from plastic wastage negative impacts?

2. What are the advantages in implementing reverse logistics?

3. What are the shortcomings using of reverse logistics?

1.4 Objectives

1.4.1. General objective

- To asses reverse logistics in plastic manufacturing companies which are found in Addis Ababa specifically who are registered.

1.4.2. Specific Objectives

- To assess reverse logistics practices in Plastic manufacturing companies.
- To assess the level of reverse logistics implementation in plastic manufacturing companies
- To analyze the challenges of reverse logistics on plastic manufacturing companies.

1.5. Significance of the Study

This study is important in several aspects for several participants. The findings of this thesis will serve as inputs to used plastic manufacturing companies; city administration solid waste management and cleansing agency; bottled water and soft drink producing companies and the government in general on how to formulate and implement environment friendly reverse logistics strategies. Second, it is a piece of contribution to the existing knowledge of reverse logistics practices on used plastic bottles and can be referred by other researchers for further research on the area.

The study can help researcher to gain valuable experience and develop more knowledge and skills and to get the overview of this study. Indirectly, the researcher is not only helping the organization to identify the strength and weakness of the company but also has an opportunity to give some recommendations for further improvement.

The study will help to know the level of the performance and the problem faced by the organization so that to improve their routine for in the future. The organization will develop idea and believed on the possible ways to improve performance in the future. Therefore, to make one's own perception and evaluation towards the company performance.

Besides that they also can raise quality of work in order to enhance quality of the organization.

Improved practices of reverse logistics practices will make the organization the first beneficiary from the study by decreasing their costs specially the importing costs for virgin materials for manufacturing process.

And it also helps to improve the existing practices and to use technologies which able to reduce wastes and to use them as input for further processing plus production. specifically, the study has the following main significances helps to better understand the processes of reverse logistics practices in related with the company under consideration, to identify bottlenecks, waste, problems and improvement opportunities in practices of the company and also to identify which reverse logistics practice is more contributing for success of operational and organizational performance of the company. Use as a guideline to facilitate a more open and transparent communication and cooperation among partners of the company. The other is for future researchers who are willing to conduct study on this topic.

1.6. Limitationofthe study

The financial limitation is one of the biggest challenges to conduct the research in relation to this as it is known as a capital city Addis A baba is a big city and the companies are also very scattered that is why the area that is going to be studied is limited in specific area only. Thus in order to finish the questionnaires it takes a month to collect the questioner. In relation to this other problem that is going to be mentioned is on collecting information through questioner most of the companies was not willing to respond any of the questionnaires. They won't even let in so in general lack of cooperation with the companies.On the other hand the rare availability of the data is one of the problems that are going to be mentioned as a barrier which is shortage of related research works on the topic was another impending of this study.

1.7. Delimitation of the study

- ✓ The geographical scope of the study focused in Addis Ababa plastic manufacturing company. This is because it is difficult to access all plastic manufacturing companies that are available according to minister of trade.

- ✓ This study focused on reverse logistics and not on forward supply chain practices or processes. The reason for this is that forward logistics has different characteristics from those of reverse logistics in terms of complexity, costs, physical distribution and cash flow (Efendigil, Onut&Kongar, 2008).

CHAPTER TWO

LITERATURE REVIEW

2. INTRODUCTION

This chapter reviews literature related to the study under the following sub titles: Theoretical review, definition of reverse logistics, benefits of reverse logistics, reverse logistics practices, reverse logistics problems and challenges, organizational performance, reverse logistics and organizational performance and empirical review.

2.1. Overview of Reverse Logistics

Today an increase in world population and living status has magnified resource consumption and the disposal rate. In other side climate changes, local and regional impacts to the weather and water pollution from human activities have significantly expanded the need for green supply chain and green logistics through the implementation of reverse logistics system or environment friendly environmental logistics. So, in this chapter the researcher will review the definitions given by different books and researchers to reverse logistics, the environmental benefits of reverse logistics, reverse logistics activities, environmental policies related with reverse logistics and corporate social responsibility of manufacturing companies in Addis Ababa by focusing on water and soft drink manufacturing companies. Reverse Logistics is the process of planning, implementing, and controlling the efficient, effective inbound flow and storage of secondary goods and related information opposite to the traditional supply chain direction for the purpose of recovering value or proper disposal (R. Dekker et al. 2004).

Reverse logistics is defined as the processes of receiving returned components or products for the purpose of recapturing value or proper disposal. Reverse logistics processes and plans rely heavily on reversing the supply chain so that companies can correctly identify and categorize returned products for disposition, an area that offers many opportunities for additional revenue. It is much more than simply counting defective items returned by customers. Also, it is much more complex than outbound shipping in that customers and/ or consumers initiate a return, making it an inbound shipment process that is less predictable. The science of reverse logistics includes return policy administration, product recall protocols, repairs processing, product repackaging, parts management,

recycling, product disposition management, maximizing liquidation values and much more (Curtis Greve and Jerry Davis Feb 2013).

According to Reverse logistics association defined reverse logistics as all activity associated with product/service after the point of sale, the ultimate goal to optimize or make more efficient after market activity, thus saving money and environmental resources. Other terms synonymous to reverse logistics are aftermarket logistics, retrogistics, or market supply chain (Reverse logistics association, 2002).

2.2. Definition of reverse logistics

Several definitions have been given for reverse logistics by different scholars, most of the definitions are related with environmental wastes and others defined it related with the reverse supply chain concept focusing to the distribution network. In this review section, definitions of reverse logistics will be discussed from initial history to the recent definitions given by authors.

Reverse logistics is a process in which a manufacturer systematically accepts the previously shipped products or parts from the point of consumption for possible recycling, remanufacturing, or disposal. Reverse logistics is a part of a broader supply chain management process called return management; a complete supply chain should include both forward and reverse logistics.
A comprehensive definition of reverse logistics is given 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. Reverse logistics is an important concept from different perspective points, in meeting customer satisfaction through product return management and end-of-use or end-of-life products can be sent back to producers for recovery, reuse or recycling. These backward flows of materials which are not needed by user anymore or which are expired to the related facilities for recycling is called reverse logistics.

Reverse logistics is a part of a broader supply chain management process called return management; a complete supply chain should include both forward and reverse logistics. In the context of supply chain, reverse logistics is part of the supply chain process that manages and plans the efficient, effective reverse flow and inventory of returned goods. Reverse logistics has mainly two basic

dimensions, economic and environmental. Economic aspects address the recovery of products with a minimum fixed and variable cost, while the environmental accounts for the proper disposal of returned products with inline of the environmental ecosystem.

Implementing reverse logistics in product recovery gives different benefits for both manufacturers and suppliers. It allows for saving in inventory, carrying cost, transportation costs, and waste disposal. The reverse logistics can lead to improve relationship with supply chain partners, improved profits through reduced costs, and improved efficiencies and higher recovery rates for turns. As cited by Amanda Badenhorst, a summary of definitioncompiled from several researchers have been presented. There are many ways to define reverse logistics and it sometimes difficult and creates confusion. For this some of the concepts which are linked and related with reverse logistics have been reviewed and discussed here.

Closed-Loop Supply Chain

As defined by Kussing&Pienaar, Closed-loop supply chain are formed when forward and reverse supply chain activities are combined into a single system in order to integrate products back in the distribution network. The closed supply chain management process controls both the activities of the forward and backward (reverse) flows and always aims at closing the loop. Closed-loop supply chain is one of the pillars of supply chain; it integrates both forward and reverse supply chain and focuses on taking back products from customers and recovering added value by reusing the entire product, and/or some of its modules, components, and parts

Product Recovery Management

Product recovery management is one part of the reverse logistics system. After their use products are collected and recovered through different mechanisms depending on their characteristics. There are different recovery strategies and several literatures categorized them as: direct reuse, repair, refurbishment, remanufacturing, recycling and disposal. These recovery strategies will be elaborated in detail below:

Direct Reuse: This where a product or an item directly reused after collection without any major processing or recovery activity. Some examples include packaging materials such as pallets and crates.

Repair: Repair recovery includes additional activities; limited disassembly, fixing and replacing of broken parts are some of them.

Refurbishment: Refurbishment is where parts of the returned products are replaced and fixed with new parts, and then they are reassembled as refurbished products. Examples are refurbishing computers and laptops.

Remanufacturing: This is to bring used products to the quality standard of new products. In this stage used products will retain their identity and functionality, they are disassembled and broken, outdated parts are fixed or replaced. Finally, they are sold as new remanufactured products. Examples include car engines and machine tools.

Cannibalization: This stage is an inspection and selection of limited amounts of parts from the collected used products, so as these parts can be reused in remanufacturing, refurbishing or repairing recovery activities.

Recycling: this recovery strategy is to reuse the materials of used products in production of the original parts or in production of other parts. In this process the identity and functionality of used products and components are lost. Recycling of metal scraps, glass, papers is an example of this category of recovery.

2.3 reverse logistics activates

Type of activity common with reverse logistics includes; logistics, warehousing, repair, refurbishment, recycling, e-waste, after market call center support, reverse fulfillment field service and many others (Reverse logistics association, 2002). Typical reverse logistics activities would be the processes a company uses to collect used, damaged, unwanted (stock balancing returns) or outdated products, in addition to the packaging and shipping materials from the end-user or the reseller. Once a product has been returned to a company, 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 or it may be sold through an outlet store. If it is not of sufficient quality to be sold through either of these options, it may be sold to a salvage company that will export the product to a foreign market. 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 firm does not perform these activities in-house, a third party firm may be contracted or the product can be sold outright to a reconditioning/remanufacturing/refurbishing firm. After

performing these activities, the product may be sold as a reconditioned or remanufactured product, but not as new (Reverse logistics association, 2002). The key players in the waste management sector in Addis Ababa are formal and informal operators in the processes of collection, separation, recycling, reuse and transportation of waste for final disposal at the city dumping site of Koshe. Formal operators are those registered and licensed to work subject to tax and space regulations. These operators include municipal cleaners and private operators authorized by government, whereas informal operators are not registered and have no legal base for the operation of their business. The latter category includes scavengers, unregistered recyclers and re-usable article sellers (Elias Mazhindu, TrynosGumbo and TendayiGondo, 2012).

2.4 Process and Activities of Reverse logistics

Reverse logistics is a return process, for this outcome several activities are involved to close the supply chain loop. The conditions of the return product determine which activities should be involved, but in general literatures pointed following key steps in a return process:

Collection: Collection is the critical and important step in reverse logistics management. Products at the end of life/end of use can be located at different sites and conditions, screening and collecting this product is one core process in reverse supply chain. Collection in the context of reverse logistics can be defined as a process by which recyclable materials are diverted from general waste stream and delivered to a processing facility. There are different forms of collection systems, in broader concept collections stations may locate in different sites so that end-users or consumers place the recoverable products in collection stations. Collection is also the initial stage for reverse logistics, where products type is selected and products are located, collected, and, if required transported to facilities for rework and remanufacturing. Used products collected should pass inspection/sorting which may be carried out either at the point/time of collection or afterwards. Pre-processing which is a partial recovery activity process may also be carried on the collection stage or at recovery facilities depending on technological and economic factors.

Inspection, separation and sorting: Collected products need to be organized and sorted depending on their characteristics. For this returned products firstly inspected with respect to quality and composition order so as to determine the appropriate recovery routine. As cited by Ji and Wang, the inspection, separation and sorting stage occurs at the collection point where the

products are inspected and sorted on the basis of their quality.After this stage, the selection of recovery strategies will follow.

Disposition: Disposition or some authors call it recovery options. Used products can be recovered through different recovery strategies, this includes direct reuse, and remanufacturing and recycling are the core ones. Direct reuse is one option to recover end-of- use products, this mainly occurs when a customer returns lightly used or unused products and inserting it to the supply chain for secondary market. The other option is remanufacturing, it is one alternative of where products are upgraded through repairing, refurbishing, or remanufacturing and item to extend the product life. The recycling options is another method for recovering materials, this option have a broad operations and this sections of the research gives more focus. The recycling recovery is to extract valuable materials so as this recovered materials can be input as raw material for the newly manufactured product. Products include scrap metals, papers, glass and plastics.

Redistribution: Redistribution is the last activity in reverse logistics network, it refers to directing reusable or recovered product to secondary market or physically moving to them to future users, this step mainly encompasses transportation and storage activities.

Even though the product recovery strategy is a baseline for deciding the process steps in reverse logistics, different studies discussed the generic process for reverse logistics. Reverse logistics comprises the following steps: gate keeping (screening), collection, sorting and disposition. Gate keeping or screening is the first important decision in reverse logistics process, this process determines the items that are approved to be returned or not.

2.5 Drivers of Reverse Logistics Activities

In reverse flow the varieties of product types effect reverse logistics practices. Reused packages, disposed computer equipment, unsold commercial goods, spare parts, packaging materials (Van Hoek 1999) are among these product categories. Besides the characteristics of returned products, companies hold to be responsible for the consequences of their activities (from raw material supply to after-sale services) and this responsibility are reinforced by legal and social enforcements. Moreover, companies own objectives like economic, corporate or marketing affect implementation of reverse logistics practices (Rogers, Tibben-Lembke 1998; Lee et al., 2000;

Wu and Cheng 2006). In practice, the presence or absence of the factors are considered drivers or barriers to reverse logistics (Lau; Wang 2009). Reverse logistics starts with the products moving back in the supply chain (De Brito and Dekker 2004). In this process there are two parties involved in reverse flow. The returner party initiates the returning with several purposes (i.e. product recalls, value recovery etc.) and the receiver party carries on activities with returned products to resell, redistribute, reuse, reprocess or recover remaining value.

Generally, the companies carry on reverse logistics because of the profit, obligatory forces or social pressure. According to this classification, the drivers are named as; economics, legislation and corporate citizenship (De Brito and Dekker, 2004).

Economic Reasons

Processing returned or used products provide substantial gains to the companies. In some cases, reusing the products can be a cheap raw material source and sometimes when the production of new products are much more expensive than recovering, reverse logistics is considered as an option. For example, copy machine producers Xerox and Canon strive on recovery activities. According to the annual reports of Xerox in 1998, recovery and reuse of materials provided saving millions of dollars annually. Canon has two facilities that perform only recovery activities in America and England. By this means, in 1997 nearly 20 million cartridges were recovered (Fleischmann 2001).

In all recovery actions, economic benefits are related with direct and indirect gains. Decreasing the use of raw materials and waste materials, obtaining valuable spare parts and other financial opportunities like second hand market are among direct gains (De Brito and Dekker 2004).

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.

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.

Obtaining valuable spare parts; the purpose is to regain the value still incorporated in a used product. Especially in the industries where product life cycles shorten day after day, it is possible to recover the whole returned product or economically valuable parts.

Other financial opportunities (second hand market); overhauled products may be used as spares or sold on secondary markets. In some situations, wastes of an industry are qualified in another industry such as metal scrap brokers collect the waste of steel producers and use them to gain economic benefit. However, the companies can also benefit indirectly by being involved in reverse logistics even there is no clear or immediate expected profit because of marketing, competition and strategic factors (De Brito and Dekker 2004).

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). 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.

Competition drivers; the purpose is to prevent others getting the technology of the firm or preventing them entering the market. For example, IBM gives great importance on reverse logistics activities. They established a unit called GARS (Global asset recovery services) to manage the flow of returned products and to prevent the competitors having their used products (Fleischmann 2001).

Strategic drivers; many countries enforce environmental legislation and charging producers with responsibility for the whole product life cycle (Fleischmann 1997). Thus the companies have to take into consideration both the current laws and possible effect of future legislation in their strategic planning.

Legislation

The legislation driver refers to any jurisdiction indicating that a company should recover its products or take them back (Peters 2009). 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.

In some industries like automobile, the producers are obliged to take back the products. Especially in European

Union, regulations such as End-of-life Vehicles Directive (ELV), Waste Electrical and Electronic Equipment Directive

(WEEE), Restriction of Use of Certain Hazardous Substances Directive (RoHS), packaging and packaging waste directive dictates the prevention of waste and promotes the recovery of waste. In Turkey since 2009 the companies in electronic industry are subject to Waste Electrical and Electronic Equipment Directive. In the directive, the responsibilities of producers start with the new product design process, production methods and proceeds to the waste disposal.

Implementation of law in EU and Turkey are in national boundaries. But considering the globalization effect, the stringent legislations would also have an impact in the worldwide. Particularly, internationally operating companies need to assess the impact of legislation in their target market or existing foreign markets.

Corporate Citizenship

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. The Japanese firm Fujitsu produces "green" products by developing a philosophy called "Green Life 21". Fujitsu places environmental issues at the top of management priorities with the philosophy. By this means, sixty six products of one hundred are green and they achieved to produce the first energy saving computer (Diaz; Alvarez; Gonzalez 2004).

2.5 Theoretical Review

2.5.1 Reverse Logistics

Reverse logistics is a process where a manufacturer accepts previously shipped products from the point of consumption for possible recycling and re-manufacturing (Fortes, 2009). It is the process of retrieving the product from the end consumer for the purposes of capturing value or proper disposal. Activities include collection combined inspection/selection/sorting, re processing direct recovery, redistribution, and disposal (Ninlawan, Seksan, Tossapol&Pilada, 2010).

Reverse logistics is usually regarded as a relatively new field of research which have received attention mainly during the last two decades. However some reverse logistics practices(recycling ,solid, waste management) was all known long before this period of time and as such they have been a topic of interest for various researchers.(De Brito,2003),s point of several authors who have contributed for the earlier development of the field.

Reverse logistics unlike traditional forward logistics, is described as a manufacturing entity that retrieves previously shipped parts and products from the point of consumption to the manufacturing entity for possible recycling, remanufacturing or, disposal. despite the finding of the 2011 supply chain foresight on the situation in south Africa, the concept "reverse logistics "has ,in recent years, gained significance attention from within realm of academia, and from operation managers and company executives (Krum wiede, 2002) reverse logistics is by nature highly complex process and a specialized area of any supply chain. No matter what the product is how it is sold or who the customers are, every organization need to focus on recovering the maximum value for returns (Gonzalez& Torre,2004).

There are many reasons and benefits to organizations for implementing reverse logistics practices which include legislative as well as many market and non-market factors. All over the world, manufacturers of carpets, batteries, automotive parts, packaging, tires and electronic products have initiated voluntary reverse logistics programs. This is because manufacturers are increasingly becoming aware of the profit opportunities afforded by remanufacturing. At the same time remanufacturing also provides feedback to the organization on the market

performance of its product in terms of its failure modes and durability which enhances the brand reputation.

In a nutshell therefore, reverse logistics provides several benefits to manufacturers, some of which include; reducing production costs, promoting an image of environmental responsibility, meeting customer demands, protecting aftermarkets to deter independent firms (external entrants) from remanufacturing and selling organization's product thus preventing losses of both market share and brand image and finally pre-empting regulation whose consequences of noncompliance would be huge financial penalties (Laosirihongthong et al., 2013).

Tibben Lembke (2002) describes the three generic strategies for competing in the marketplace as low-cost leadership, differentiation and focus. One avenue of creating a competitive advantage with differentiation is through building a brand reputation (Grant, 1991).

An organization may choose to focus on implementing reverse logistics practices to expose the negative environmental performance of its competitors. In this way, the organization can cut a niche for its products. Developing and implementing reverse logistics practices can only be achieved through creating environmentally responsible policies and investing in the necessary equipment and training. Creating a competitive advantage through implementing reverse logistics practices would lead to improved market share and consequently higher profit margins (Fortes, 2009).

2.5.2 Meaning of reverse logistics

Reverse logistics as it was defined by Rogers and Tibben-Lembke (1998):"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.

The APICS dictionary defines reverse logistics as "a complete supply chain dedicated to the reverse flow of products and materials for the purpose of returns repairs remanufacture and recycling. Another commonly used commercial definitions to another point, for the purpose of capturing value otherwise unavailable, or for the proper disposal of products.

The reverse logistics association defines reverse logistics as "all activates associated with a product or service after the point of sales, the ultimate goal to optimize or make more efficient after market activity, thus saving money and environmental resources. According to Gailen Vick, president of the reverse logistics association, "in other words, any time money is taken from a company's warranty reserve or service logistics budget that isa reverse logistics operation.

Reverse logistics has become significance because organizations are under increasing pressure from many stock holders groups, including shareholders, customer ,employees,suppliers, reverse supply chain partners, governmentagencies, nonprofit organization and the public environment (Wang et al 2010) owning to environmental issues, legislation and consumer expectation.

Generally speaking, an effective reverse logistics operation benefits both the organization and its customers (Ambmetethy and lillions, 1995).therefore, some of the benefits of reverse logistics include: cost reduction resulting from effective reverse logistics management, waste and environmental (green supply chain) cost reductions and customer satisfaction and competitive advantages.

Many factors influence the implementation of effective reverse logistics and these pose challenges for many organization and supply chain. There are numerous barriers that make it difficult to have efficient and effective reverse logistics process in place (Ravi & Shankar, 2005).

2.5.3 Benefits of reverse logistics

From simplifying an operational process to optimizing a supply chain to minimize logistics cost, there are many ways to make a business more suitable and environmental friendly. however regardless of which angle a business choose to approach greening their reverse logistics from, they are going to benefit their company in many ways from increasing revenues to securing industry first mover advantages, which will give them a competitive advantages over their rival competitors. Some important benefits of a reverse logistics include:

First and foremost, the most important benefit that can be gained from a more sophisticated reverse supply chain is additional revenue. Companies whose supply chain includes a well-developed reverse logistics section are much more likely to successfully restore returned

products to their manufacturing or wholesales facilities, where they will potentially gain revenue from secondary sales or mass sale to secondary channels of distribution (Guntini, 1996).
Another additional value that can be realized from more efficient take-back logistics is a decrease in the cost of the goods that are sold to consumers. In addition to raw materials and manufacturing costs, a product cost includes overhead costs, which can include potential handling costs, which can include potential handling costs if a product is returned by making the companies reverse logistics more effective, these overhead cost can be decreased, which would decrease the overall cost of goods, and increase profits from revenues as well (Murphy,1989).

Another monetary gain that can be accomplished with better returns management is an improvement in the company asset turn over radiate asset turnover ratio measures the dollar amount of sales that is generated from firm's asset, determining how efficiently assets are used to create revenue. If returns are better managed, lose from returns can be minimized and the greatest amount possible will be recovered from every items that is returned by consumers. This will maximize the value of the company asset against their liabilities, and since returns will be generating secondary profit, it will help the business produce the greatest amount of the sales and improve their assets turnover ratio. (Murphy et al,1989).

In addition to monetary gains a more efficiency reverser supply chain can bring other potential benefits to a company. Customer service is very high on the most corporate mission and value declaration, as pleasing customer is the most highly effective way to keep them loyal to keep them buying more products from the same company. By assuring as much each as possible in the returns process, companies can gain valuable customer satisfaction and loyalty and ensure that those customers will not leave them for a competitor due to lacking an efficient returns mechanism. (Dowlatshahi and shad,2000).

By implementing environmental measures and greening some aspects of their operations process, companies can not only gain advantages by becoming more environmentally friendly, but also by avoiding penalties for contributing to carbon emission and other actions that contribute to global warning (Tibben-Lembke and Ronalds S, 1998).avoiding monetary penalties also be benefit by

decreasing potential costs that could erode the company's bottom line and financial position in the industry.

Looking at reverse logistics from different perspective, a more efficient reverse supply chain provides more advantage to a company by presenting it with a guaranteed disposal system for returned goods or goods that are at the end of life stage in their value chain. By having secondary channels established through which products can be distributed to out let stores or otherwise removed from the primary supply chain, a company ensures that returned product will have a place in the company operations. Guaranteed disposal reduce the pressure on firms that have larger disposal costs, by providing a channel that will eventually dispose of returned products after all possible value has been extracted from them. (Tibbne-Lembke and Ronald S, 1998).

A more global advantage of having a superior reverse supply chain is an enhanced company and brand image the firm in the industry. Through increased environmental care, companies can capture customer satisfaction and locality, which will aid them in continuing to improve their financial performance. Loyal customer are greatest investment due to their power to act as brand ambassador, and introduce the company to other people who have not engaged with the company in the past. thus the company will possibly end up capturing additional market share and expanding their presence in the market, which is a great advantage not only from business stand point but from environmental one as well, since they will be spreading sustainable practices to more people throughout the industry (Daughton, 2005).

2.5.4 Reverse Logistics Practices

Reverse logistics is the term commonly used to describe end of life product management. This means that reverse logistics is mainly concerned with return or take-back products and materials from the point of consumption to the forward supply chain for the purpose of recycling, reuse, remanufacture, repair, refurbishing or safe disposal (Carter &Ellram, 1998). Reverse logistics focuses on getting product back from customers rather than moving products to customers. Broadly defined, reverse logistics includes shipments of packaging waste, recyclable packages and customer returns in the logistics system. It is also important to note that reverse logistics emphasizes source reduction and substitution over reuse and recycling (Wu & Dunn, 1995). This

refers to doing the same things with less resources hence eliminating waste. There are three broad concepts on which reverse logistics is based and these are reuse, remanufacturing and recycling (Eltayeb et al., 2011).

Reuse Reverse Logistics Practices

Reuse is the process of collecting completely unused or slightly used products from the consumer and injecting them back into the supply chain without any upgrade or processing. The ultimate value of the product is therefore reduced (Eltayeb et al., 2011).

Practices under reuse include return of used products and packaging to suppliers for reuse, setting of quality standards for reuse, generating energy from renewable sources of energy and designing products for reuse (Rao& Holt, 2005).This study examines the extent to which the above reuse reverse logistics practices have been put into use by firms.

Remanufacturing Reverse Logistics Practices

In remanufacture, a product is collected from the field, assessed and there after either repaired, refurbished or overhauled. This entails replacing the defective parts of the product with refurbished or new parts. Remanufacture takes place when there is no possibility of direct reuse of the product or such a reuse is no longer economical. If managed properly, remanufacture can generate lucrative business opportunities through recapturing otherwise lost value (Toffel, 2004).

Practices under remanufacture include setting up of repair workshops, training employees on repair and refurbishing and setting up warehouses for storage of parts. Another common practice in remanufacturing is the issuance of a warranty. This is especially common with electronic products' manufacturers for instance LG and Samsung who issue warranties of up to one year on their products (Azevedo et al., 2011).

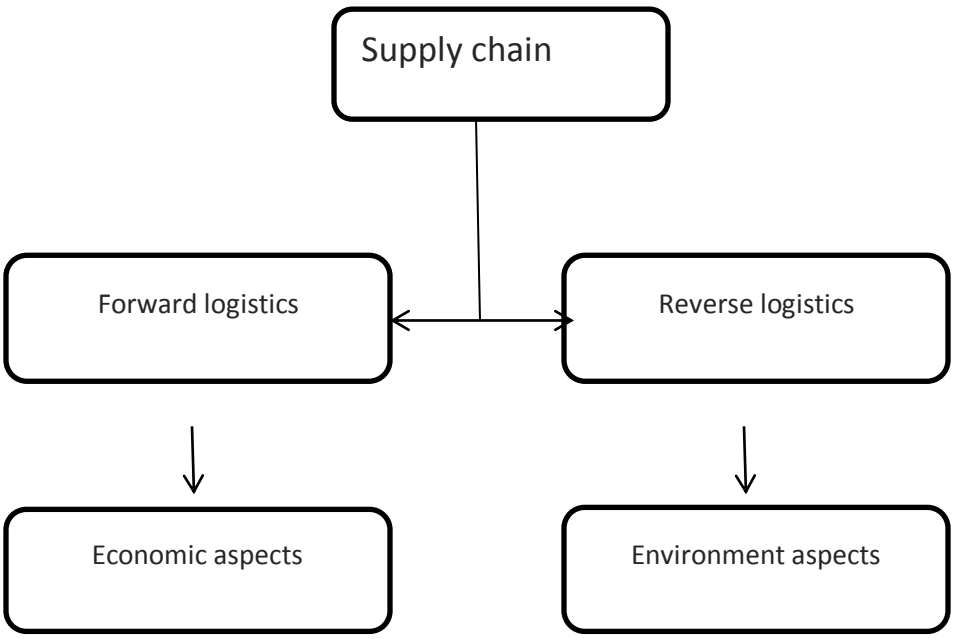
Recycling Reverse Logistics Practices

Recycling is the process of recovering any piece of a returned product that may contain value. In recycling, collected used products are disassembled and useful material extracted from them. The identity and functionality of the original material is lost (Eltayeb et al., 2011).

Practices under recycling include return of used products and packaging to suppliers for recycling, executing well-structured market incentives and having a well-documented recycling policy. Another practice under recycling includes the sensitization or creation of awareness to the buyer. Organizations may create awareness by putting the recycling labels of three arrows

intertwining clockwise as a sign that the product or the package should be recycled (Laosirihongthong et al., 2013).

Conceptual frame work



Source: Conceptual theoretical framework adopted from M.Kabergey, Salome Richu (2015) and A. Eshikhati (2014) and modified by the researcher.

2.6 Empirical Review

Internationally, a number of studies have been done to try and establish the relationship between reverse logistics practices adoption and organizational performance. Green et al. (2011) found out that successful implementation of GSCM practices such as green purchasing, cooperation with customers, Eco design and reverse logistics will lead to improved environmental and economic performance which support improved organizational performance. Further, their findings show that cost saving nature of reverse logistics should lead to improved economic performance and both environmental performance and economic performance should yield improved operational efficiency.

These generate cost savings and reflect on an organization's ability to satisfy changing customer demands for environmentally sustainable products and services. According to Rao and Holt (2005), green supplies chains do give firms competitive advantage and also lead to increased economic performance. They observed that the image of products of firms that practiced reverse logistics in Philippines had been positively affected giving such firms a competitive advantage. Their study mainly focused on the financial outcomes of organizational performance.

Eltayeb et al. (2011) investigated the outcomes of green supply chain initiatives among certified companies in Malaysia and environmental sustainability. Among the four possible outcomes they investigated, which included environmental outcomes, economic outcomes, cost reductions and intangible outcomes, reverse logistics was found to have a significant positive effect on cost reductions only.

According to De Giovanni and Esposito Vinzi (2012) in their study of covariance versus component-based estimations of performance in green supply chain management, they found that no significant relationship exists between green supply chain management practices and organizational performance especially economic performance.

Azevedo*et al*., (2011) explored the influence of green practices on supply chain performance with a focus on the automotive industry in Portugal. This study provides evidence that green practices have a positive effect on quality, customer satisfaction and efficiency. However, it also identifies that green practices are costly to implement and therefore have a negative effect on the financial performance of firms.

Research conducted by Serut (2013) whose main concern was on the financial aspect of organizational performance. Although his study found a positive relationship between reverse logistics and organizational performance. He focused specifically on the relationship between adoption of reverse logistics and organizational performance of manufacturing firms in the country.

There have also been a few studies that have focused on reverse logistics in Kenya. Waithaka(2012) studied the reverse logistics practices in medical supplies by looking at the case study of Kenya Medical Supply Agency. Although his study showed that the adoption of reverse logistics practices at the Kenya Medical Supply Agencies was low, there was a positive relationship between reverse logistics and operational performance of the agency. Ongombe (2012) looked at the relationship between reverse logistics and competitive advantage in water bottling companies in Nairobi. The study concluded that there was indeed a strong relationship between reverse logistics and competitive advantage. Companies that implemented reverse logistics practices benefitted from increased profit margins due to reduction in production costs and increased sales.Langat (2012 examined reverse supply chain management practices in large scale manufacturing firms in Nairobi. His study observed a significant influence of implementation of reverse supply chain practices to the organizations' financial performance. Another study focusing on reverse logistics done in Kenya was by Gitau (2010) who studied the effects of reverse logistics on the performance of East African Breweries. This study found a positive relationship between the two.

There is also been a study that have focused on reverse logistics in Ethiopia.Matiwos (2014) studied the implication on reverse logistics practices of bottled water manufacturing in Ethiopia. His study observed a significant influence of implementation of reverse logistics for bottled water manufacturing companies for the environmental sustainability when they are forced by law.

2.7 Organizational Performance

Organizational performance is the analysis of the actual results or output of an organization measured against its intended outputs. According to Richard, Devinney, Yip and Johnson (2009) organizational performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment.); product market performance (sales, market share.); and shareholder return (total shareholder return, economic value added.)

A key performance indicator is a quantifiable measure a company uses to determine how well it meets the set organizational goals. Using financial indicators in business performance measurement allows an organization to compare different business types. According to Barney (1991) resources can be classified into organizational capital resources, physical capital resources and human capital resources. Capabilities can be defined as the skills a firm needs to take full advantage of its assets.

An organization can define its own operating objectives and use them to evaluate their performance. Some of the measures it can use include: Activity ratios evaluate how efficiently the company manages its business. The asset turnover measures how effectively the company puts its assets to work. The inventory turnover evaluates how efficiently the company manages its inventory. A higher turnover means better performance for both ratios. Value added is calculated as the difference between the operating result and the cost of capital of the average net assets. Alternatively, the value added can be determined by using the main value drivers: return on sales and net assets 'Return on sales is of particular importance for assessing profitability. The combination of return on sales and net assets' productivity results in return on net assets (RONA). If RONA exceeds the cost of capital, value is created for our shareholders (Huselid, 1995).

Organizations performance is process to enhance both the effectiveness of an organization and the well-being of its member through planned interventions. One of the three key points of the organizational development will which lead to organizational performance are when many of organization development effort to increasing organizational learning, with the intent of then impacting organizational performance (Jon & Randy, 2009).

Organizational performance was referring to the actual output or results of an organization as measured against its intended outputs, goals and objective (Jon & Randy, 2009). There are four types of organizational performance measures, first human resource outcomes, second organizational outcomes, third financial accounting outcome, and lastly capital market outcomes. Human resource outcomes related to change in employee behavior which included employee satisfaction, turn over and absenteeism. Organizational outcomes contain labor productivity, customer satisfaction, and quality of product services. Financial accounting outcomes included three measures such as returns on assets, return on equity and profitability. Capital market outcomes reflect how market evaluates an organization which consists of the three indicators which is stock price, growth rate of stock price and market returns (Dyer & Reeves, 1995).

Organizational performance basically can be defined as the outcome that indicate or reflect the organization efficiencies or inefficiencies in term of corporate image, competencies and financial performance (Khandekar& Sharma, 2006). Work performance is the way employee perform their work. An employee's performance is determined during job performance review, with an employer taking into account factor such as leadership skills and productivity to analyze each employee on an individual basis. Job performance reviews are often done yearly and can determine raise eligibility, whether an employee is right for promotion or even if an employee should be fired (Rowold, 2011).

There were so many ways to evaluate employee work performance. According to Rowold (2011) high performance work system and practices have need identified as playing a key role in the achievement of business goals and improved organizational effectiveness. While there is no agreement on an ideal configuration or bundle of such systems and practices. The logic is that high performance work systems influence and align employee's attitude and behaviors with strategic goal of the organization and they increase employee commitment and subsequently organizational performance.

Organizations are commonly defined as instruments of purpose. They are seen as coordinated by intentions and goals (James & Robert, 1997). Purpose of organizational success and failure in fulfilling those purposes are conspicuous part of conventional discourse. Business firm are compared in terms of profits, sales, market share, productivity, debt ratios, and stock prices. For

hospital they used cost recovery, mortality, morbidity rates, board certification of physicians and occupancy rates (James & Robert, 1997).

The ability of an organization to sustain the delivery of quality product and service is essential to its long-term success. They have observe three major deterrents to sustaining high performance which is firstly leadership or management of an organization has an inaccurate understanding of the marketplace in which the organization must compete, secondly behavior required to successfully implement the business strategy are out of alignment with customer and market place requirement and lastly organizational system and process often fail to support the organizational version and strategy (Owen, Ron, Will, & Robert, 2001).

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

Introduction

This section describes the methodology undertaken in relation to justification of describes the method and techniques that were adopted to collect data for the analysis of field data. As a result, the research design, data requirement and sources, sampling frame and techniques, the data collection tools and techniques, the data analysis and presentation methods have been discussed.

3.1 Research design

A research design, which is a function of the research objectives, is defined as "a set of advance decisions that makes up the master plan specifying the methods and procedures for collecting and analyzing the needed information" (Burns & Bush, 2002, p.120). An appropriate research design is essential as it determines the type of data, data collection technique, the sampling methodology and the budget (Hair et. al., 2003).

In an attempt to assess the reverse logistics practices, implementation and challenges of plastic manufacturing in Addis Ababa, the researcher used descriptive type of research design. Descriptive statistics analysis is used in the interpretation and discussion. Descriptive research is a type of research that is mainly concerned with describing the nature or condition and the degree in detail of the present situation. Creswell (1994) stated that the descriptive method of research is used to gather information about the present or existing condition.

3.2 Data measurement

In addition to other close ended and open ended questions, the questionnaires also included likert scaled questions. So the data measurement for the questions used likert method, a self-report techniques for attitude measurement in which respondents were asked to indicate there degree of agreement or disagreement with each of a number of statements (churchil, 1989). In relation to the number of scale points, there is no clear rule indicating an ideal number.

However, researchers acknowledge that opinions can be captured best with five to seven point scales (Aaker et al., 2000; Malhotra,1999). In fact, researchers indicate that a five-point scale is just as good as any other (Malhotra, 1999; Parasuraman, 1991). That is, an increase in scale does

not improve the reliability of the ratings (Elmore &Beggs 1975) and may cause confusion to the respondents (Aaker et al., 2000; Hair et al., 2003). Thus, a five-point Likert scale was used in this research, specifically the Response Options are:

1=strongly disagree, 2=disagree, 3= Neutral,4=agree, 5=strongly agree(Level of agreement)

1= Very low, 2= Low, 3= Medium/average, 4= High, 5= Very high

3.3 TargetPopulation and sampling technique

To undertake this research the sampling process included several activities: define the population, establish the sampling frame, determine the sample size and select the sample.

Population**:** The population for this study was defined as companies who involve on manufacturing plastic materials at the time of the survey was conducted. Therefore target populations of this research were all 266 plastic manufacturing companies that are found in all sub cities, Addis Ababa. For this study, lists of manufacturing companies in each sub cities were got from ministry of trade data base as a readily available list of population elements (ministry of trade data base, 2017).

Sampling frame**:** To establish the sample frame, a list of plastic manufacturing was obtained from ministry of trade and industry of the ten sub cities, from AkakiKality sub city, Kolfe, Gulele, Lideta, NefasSilik, Arada, Yeka, Adis, and Bole , Kirkos sub city.

The **sample size** is taken based on the formula Solvin U. (2012).

$$n = \frac{N}{\quad}$$

$$1+N(e)^2$$

Where n= sample size N= total population 1=constant e= error estimate

5% at 95% confidence interval e= 0.10

$$n=\frac{266}{1+266(0.10)^2}$$

$$=\frac{266}{3.66}$$

$$=72.677 \approx 73$$

It is obvious that the entire sub cities are contain different number of plastic manufacturing companies. Thus to make it simple and understandable the sampling technique will be stratified proportionate. Then the required number of samples from each sub cities will be selected by using simple random sampling technique.

Sub city	No of plastic manufacturing company	%	sample size
Addis Ketema	39	15	11
Akakikality	38	14	10
Arada	15	6	4
Bole	27	10	7
Gulele	18	7	5
Ledeta	17	6	4
Kirkos	12	5	4
Kolfe	42	16	12
Nefas Silk	46	17	12
Yeka	12	4	3
Total	266	100	73

Table.3.1 the sample size of different sub city

3.4 **Data collection**

To achieve the aim of this research, thirty three questions were designed and administered to the company in four parts. The first part of questionnaire was used to collect demographic data such as gender, age, level of education and experience.The second part of the questionnaire was designed with the purpose of collecting data about reverse logistics practices, the third was about the implementation of practices of reverse logistics specifically and the last one is about the challenges.

The Primary data can be using questionnaire both qualitative and quantitative, interviews and some observations fall under qualitative research methods, and other observations and surveys fall under quantitative research methods**.** According Sekaran&Bougie (2009), primary data is other types of information such as the perceptions and attitudes of employees are best obtained by talking to them by observing events, people, and objects, or administering questionnaire to individual.

Secondary data books, journals, articles, thesis, and power points, Internet. The secondary data refers to the information gathered earlier before the actual research takes place. The types of data are books, journals, reports, thesis, and other related information about the study.

3.5 **Data sources and type**

Primary and secondary will be the source of the data. The researcher will use primary data and secondary data for the entire analysis of this study. The information will gather through questionnaire from the selected sample of respondents. The data collected from the respondents through questionnaires will be used as primary data.

3.6 Data analysis

Data analysis is by using SPSS (Statistical Package for Social Sciences) to explain, understand and summarize the data that will be collected. In addition both descriptive and inferential statistics method of data analysis was used. Descriptive statistics like mean, frequency and percentile to analyze respondent background and related issues.

3.7 Reliability and validity of the research

Reliability is the consistency of a set measurements or measuring instrument, often used to describe a test. Reliability is inversely proportional to a random error (Pellissier, 2007). There are several different reliability coefficients. One of the most commonly used is called Cronbach's Alpha. Cronbach's Alpha is based on the average correlation of items within a test if the items are standardized. Cronbach's Alpha reliability analysis was conducted in order to determine the reliability of the instrument used. Lack of reliability is a serious drawback of an outcome measure as it indicates errors in measurements (Pellissier, 2007).

To test the validity and reliability of the research instruments, a pilot test was conducted. According to Mugenda (2003), the number involved in the pilot test should not be large. A pretest sample of between 1% and 10 % is good depending on the sample size. In this study, a total of 10 questionnaires were distributed using systematic random sampling and collected afterwards for analysis. Based on pilot test results some modifications were made with the questionnaires to increase understandability which increase response rate.

The questionnaires were coded in SPSS version 21 and Crocbach was computed and compared with the threshold value of 0.86 was obtained which implied that the research instruments were reliable.

Validity is concerned with whether the findings are really about what they appear to be about (Anol 2012). Validity defined as the extent to which data collection method or methods accurately measure what they were intended to measure (Anol, 2012).Numbers of different steps were taken to ensure the validity of the study:

- ✓ The data was collected from the reliable sources, from the company who adopt reverse logistics practice (reuse & recycle).
- ✓ The survey questioner were standardized and used by previous researchers.

3.8 Ethical consideration

According to Saunders, Lewis and Thornhill (2001, p.130) "Ethics refers to the appropriateness of your behavior in relation to the rights of those who became the subject of your work, or are affected by it". The data were collected from the sample respondent through questionnaires; the respondents were not required to write their name. The result of the study is to be used for academic purpose only and the response of the participant is fully confidential. The information that the respondent gave was analyzed without any change by the researcher. Furthermore, the work that has been used in this research as a base for this study were cited appropriately as the researcher respect the work of previous studies. The study governed by the general rules of research ethics in such a way that respondents were requested to provide information on voluntary basis, there was prior communication about the purpose of the study, and confidentiality of the information was guaranteed.

CHAPTE FOUR

DATA PRESENTATION AND ANALYSIS

Introduction

This chapter presents an analysis of data collected and discusses the findings on the assessment of reverse logistics practices in plastic manufacturing companies. This chapter deals with the presentation, interpretation and analysis of data gathered from both primary and secondary sources.

4.1 Response rate

The survey was conducted during in three week time. From the total 73 questionnaires distributed 48 were returned.five of the questionnaires are not returned at all therefore, 48 were effectively used for analysis and it makes the response rate 66% (Visser, Krosnick, Marquette and Curtin (1996) who showed that surveys with lower response rates (near 20%) yielded more accurate measurements than did surveys with higher response rates (near 60 or 70%).

4.2 Demographic information of the respondents

The first part of the questioner consists of the demographic information of the participants. This part of the questioner demanded a limited amount of questions about the respondents. Like their level of education, length of service in the company, age and gender. Accordingly, their responses were summarized in the following tables.

Table 4.1. Personal information of respondent

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	33	68.8	68.8	68.8
	female	15	31.3	31.3	100.0
	Total	48	100.0	100.0	

From the total population of the respondents 68.8% are male and the rest 31.3% are female.it implies that female employee participation in organizations are very low which is expected to be improved.

Table.2 age of the respondent

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	2	4.2	4.2	4.2
	26-35	23	47.9	47.9	52.1
	36-45	19	39.6	39.6	91.7
	46-55	3	6.3	6.3	97.9
	56 and above	1	2.1	2.1	100.0
	Total	48	100.0	100.0	

As show in the table above the respondents age are different from one another but as we can see it categorized the age of the respondent on five the first two are the only age group between 18-25 the second category takes the highest value from all age groups so the majority of employees are about this age which is considered as a productive age group and the third categories is 36-45 and the percent is 39.6 less than half of the percent and the forth one is older than the previous the last one is the only respondent on above 56age.

Table.3 level of education

level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	6	12.5	12.5	12.5
	Degree	33	68.8	68.8	81.3
	Masters	9	18.8	18.8	100.0
	Total	48	100.0	100.0	

As shown in the table 3 the highest education level attained by most of the respondent was University Degree which represents 68.8% (33) out of the valid respondent, followed masters with 18.8 % (9) next to the masters the diploma will be followed by 12.5% (6) of the total respondents. We can talk into that from these data shows the highest percentage is first degree and above from this it is possible to say that from the total respondent of the companies 87.6 percent have better understanding about the working condition.

Table 4 Frequency distribution of experiences

year of experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5	18	37.5	37.5	37.5
	6-10	23	47.9	47.9	85.4
	11-15	5	10.4	10.4	95.8
	21 and above	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

From the respondents 18(37.5%) of them are have experience 5 year, 23(47.9%) of them have a work experience between 6 and 10, five of the respondent about 10.4% have more than ten years' experience more than 20 years only two of the respondent which implies they are highly equipped with knowledge. can be conclude that the organizations workers have sufficient experiences to judge and give views. This is because when the respondents are more and more experienced with better opportunity to know more about the organization working systems

Results/Findings of the study

Reverse logistics practice in plastic manufacturing companies

Table 4.1.1

formally defined reverse logistics practice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	22	45.8	45.8	45.8
	Disagree	8	16.7	16.7	62.5
	Neutral	8	16.7	16.7	79.2
	Agree	7	14.6	14.6	93.8
	strongly agree	3	6.3	6.3	100.0
	Total	48	100.0	100.0	

As a result on the above table 45.8% of respondents are disagreed on formally defined reverse logistics practices like reconditioning and reusing by giving response strongly disagree, 16.7% of the respondents disagreed and like the same percent of this they are neutral and 14.6% and 6.3% of respondents are agree on idea of no such kinds of practices on the company.so finally it implies that there is somehow the practices.

Table 4.1.2

engaged at least one of the practice of reverse logistics activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	15	31.3	31.3	31.3
	Disagree	4	8.3	8.3	39.6
	Neutral	11	22.9	22.9	62.5
	Agree	14	29.2	29.2	91.7
	strongly agree	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

From the respondents 29.2% of them are at least they are engaged on one of the practices on different reasons, 22.9% are neutral and 31.3% respondents are strongly disagree on the practices which implies that none of the activities of reverse logistics are available on the company. thus this table indicate that there are companies who are not engaging at least one of the practices of reverse logistics even though those companies are in the lists of plastic manufacturing companies.

Table 4.1.3

gathering and handling items

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	27	56.3	56.3	56.3
	Disagree	1	2.1	2.1	58.3
	Neutral	7	14.6	14.6	72.9
	Agree	9	18.8	18.8	91.7
	strongly agree	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

From the total of the respondent 56.3% of them are not dealing with items out of use and making them usable after some processing , 18.8% are agreed, 14.6% are neutral means that they didn't use any of the items for capturing value again.8.3% and 2.1% respectively strongly agree and disagree. Thus this table shows that from the total respondents which is more than half of

respondents of the companies they just use the raw materials for producing the items for the customers which means that those companies have high cost for importing the raw materials.

Table 4.1.4

distribute items that are collected previously

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	33	68.8	68.8	68.8
	Disagree	3	6.3	6.3	75.0
	Neutral	5	10.4	10.4	85.4
	Agree	2	4.2	4.2	89.6
	strongly agree	5	10.4	10.4	100.0
	Total	48	100.0	100.0	

The majority of this table respondent is 68.8% almost more than half strongly disagree with the concept of distributing the items that are previously collected and after some processing make the product usable again. The respondents who are agreeing with the question are less than ten percent which is 4.2%.thus very few of the companies are responsible for what their companies is producing and at the same time it helps to decrees the costs of raw materials.

Table 4.1.5

inspection and select limited parts from the collected used product

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	29	60.4	60.4	60.4
	Disagree	7	14.6	14.6	75.0
	Neutral	8	16.7	16.7	91.7
	Agree	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

like the above table the majority respondent of this table are more than half of the percent which is 60.4% strongly disagree with the practice of inspection and select limited amounts of parts from the collected used products, so as these parts can be reused in remanufacturing, refurbishing

or repairing recovery activities and the one who respond agree are about 8.3% of the respondent.For the question of collecting returned products from the consumer for further processing Out of the total respondents of the questionnaire the 50.0 % strongly disagreed on collecting returned products from the consumer for further process and recapture value, the 31.3 % of the total respondents agreed on the collection of returned products from the consumer for further process and recapture value. The10.4 % of the respondents is neutral on the task being collected to be performed by the company.

Table 4.1.6

benefits from the practice of reverse logistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	19	39.6	39.6	39.6
	Disagree	7	14.6	14.6	54.2
	Neutral	8	16.7	16.7	70.8
	Agree	7	14.6	14.6	85.4
	strongly agree	7	14.6	14.6	100.0
	Total	48	100.0	100.0	

As shown on the previous four tables most of the respondent disagree with the practices and are not using the practices thus there is no way they can be benefited with the practices unless they are using that is why the on the above table the sum of strongly disagree (39.6%) and disagree (14.6%) are more than the half of the respondent.

Table 4.1.7

disadvantages of the practice of reverse logistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	31	64.6	64.6	64.6
	Disagree	3	6.3	6.3	70.8
	Neutral	8	16.7	16.7	87.5
	Agree	6	12.5	12.5	100.0
	Total	48	100.0	100.0	

On this table also the same thing is true because as it is stated earlier on the table the company cannot be benefited or disadvantageous if they are not engaged on the practices thus as shown on this table much of the respondent strongly disagree (64.6%) with the concept being disadvantageous because of the practices. The same is true for the respondent of neutral (16.7%).thus in the first place if the companies are not practicing the reverse logistics activates its difficult to know the advantages and disadvantages.

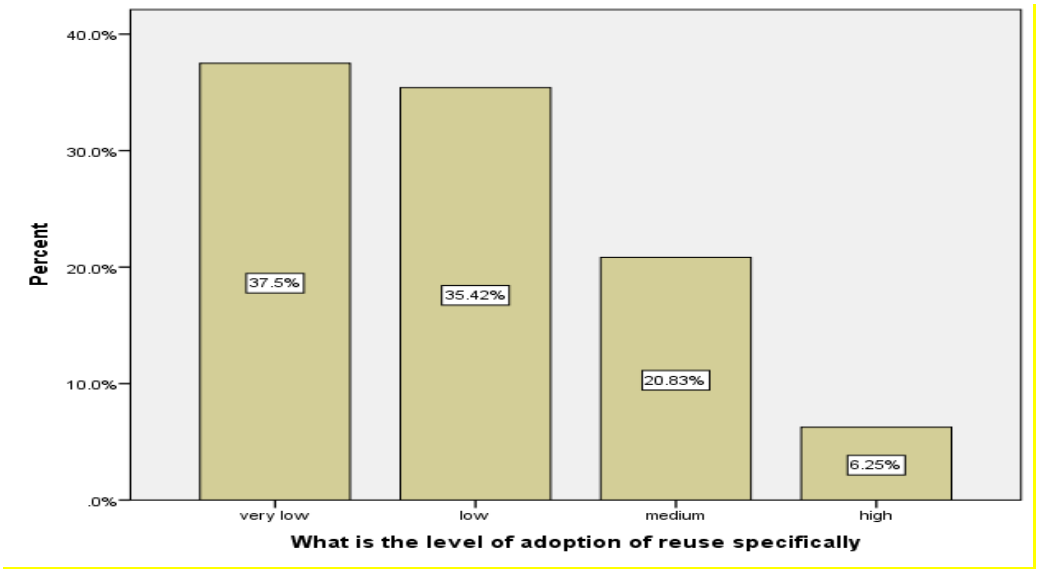
Table 4.1.8

appropriate reverse logistics system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	21	43.8	43.8	43.8
	Disagree	11	22.9	22.9	66.7
	Neutral	12	25.0	25.0	91.7
	Agree	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

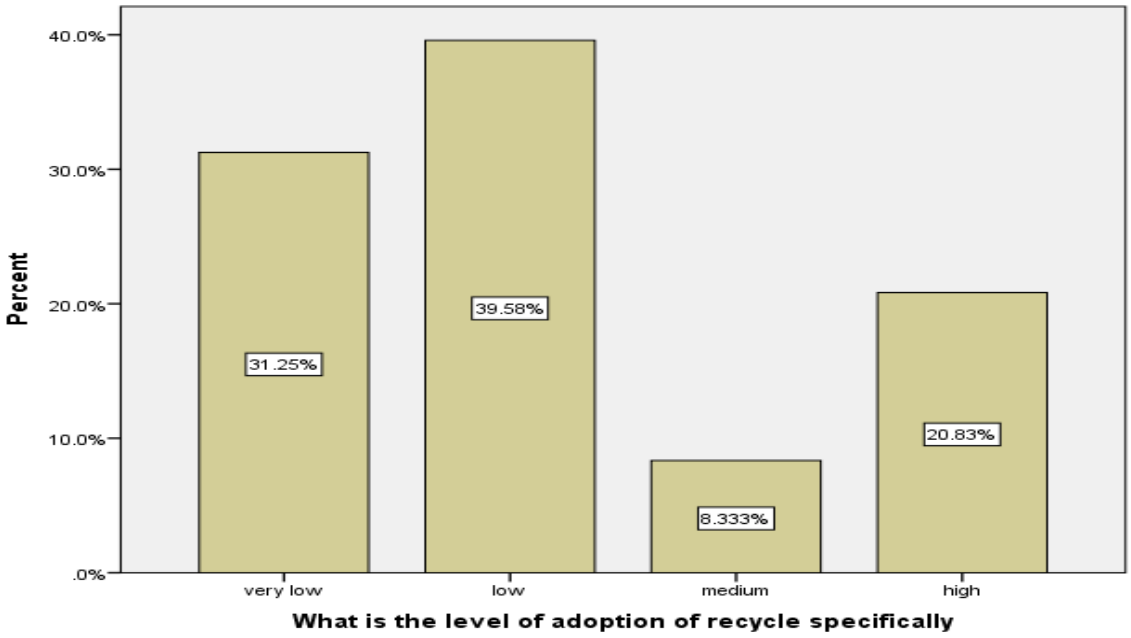
The response rate of the strongly disagree is 43.8% of the respondent and disagree is 22.9% so the sum of this two percent is more than half of the respondent. This implies that the company doesn‘t prepare out the appropriate reverse logistics system. Even some of the companies have no information about by having appropriate reverse logistics system can save cost and increased the performance of the company.

3.8.1 The Level of reverse logistics implementation in Plastic Manufacturing companies



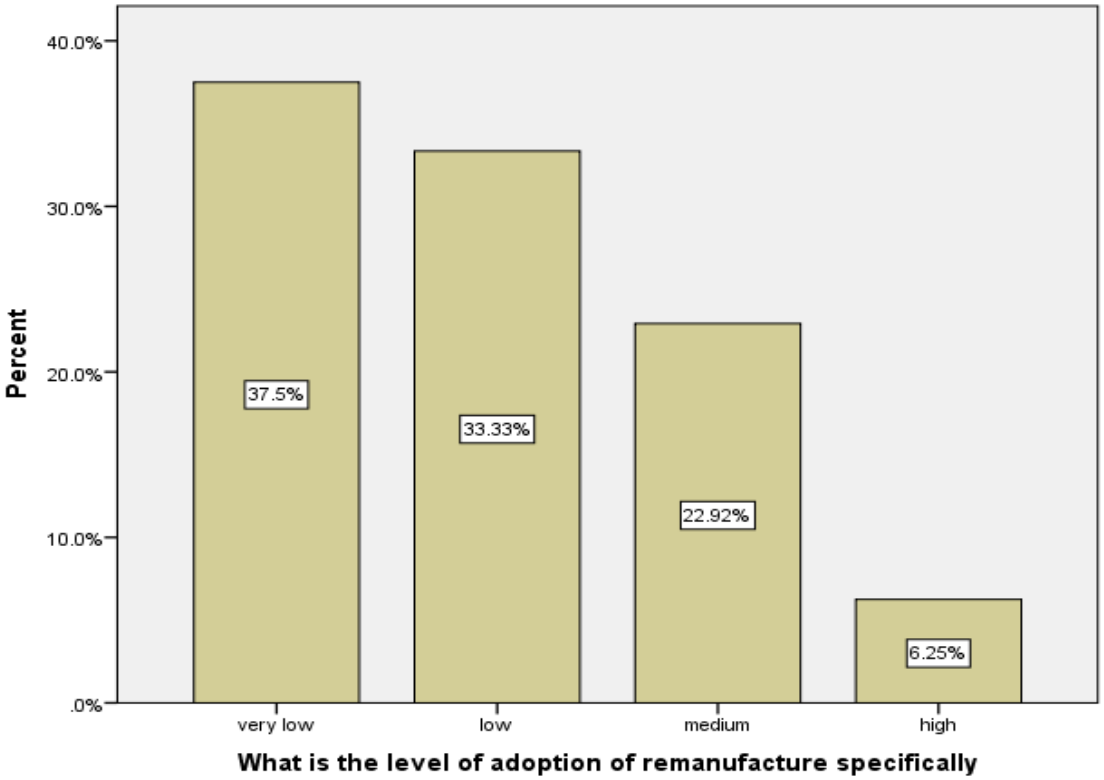
Graph 4.2.1

As shown in the graph the level of implementation of reuse using again the items after some processing is between very low (37.5%) and low (35.42%), the company reuse are about 20.83% and the company those are using it are about 6.25%.this implies that most of the companies are not using the products that are produce at once.



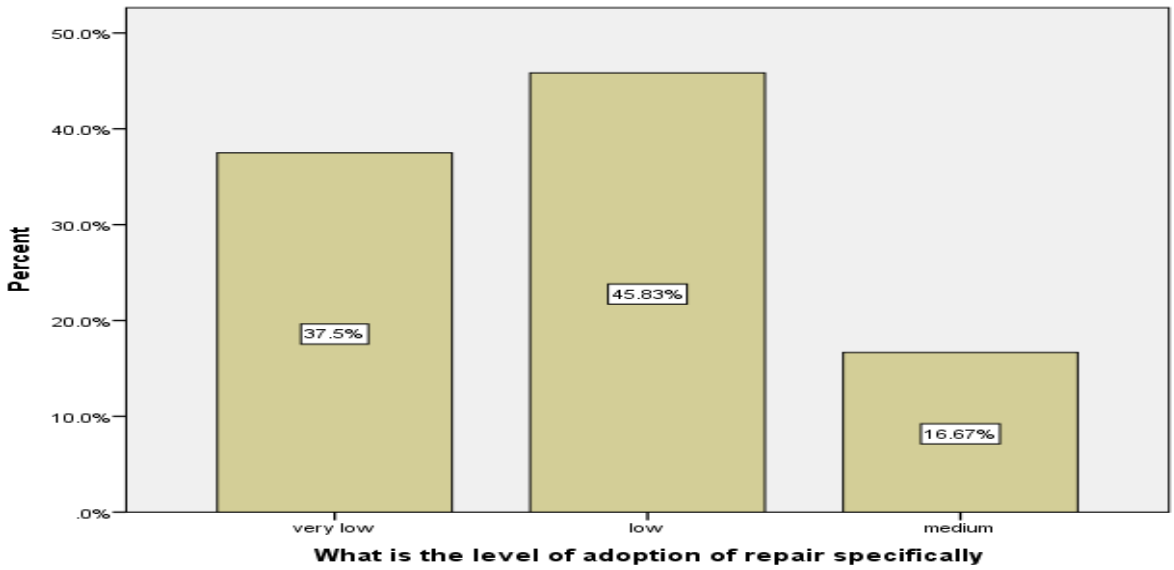
Graph 4.2.2

The result from this graph shows most of the company didn't use any recycling process for the sake of environment almost 70.83% are poor on the process which is very low31.25% and low 39.58% didn't participate rather the rest 20.83% and 8.33% are between the range of high and medium hence it is not applicable on many of the company.



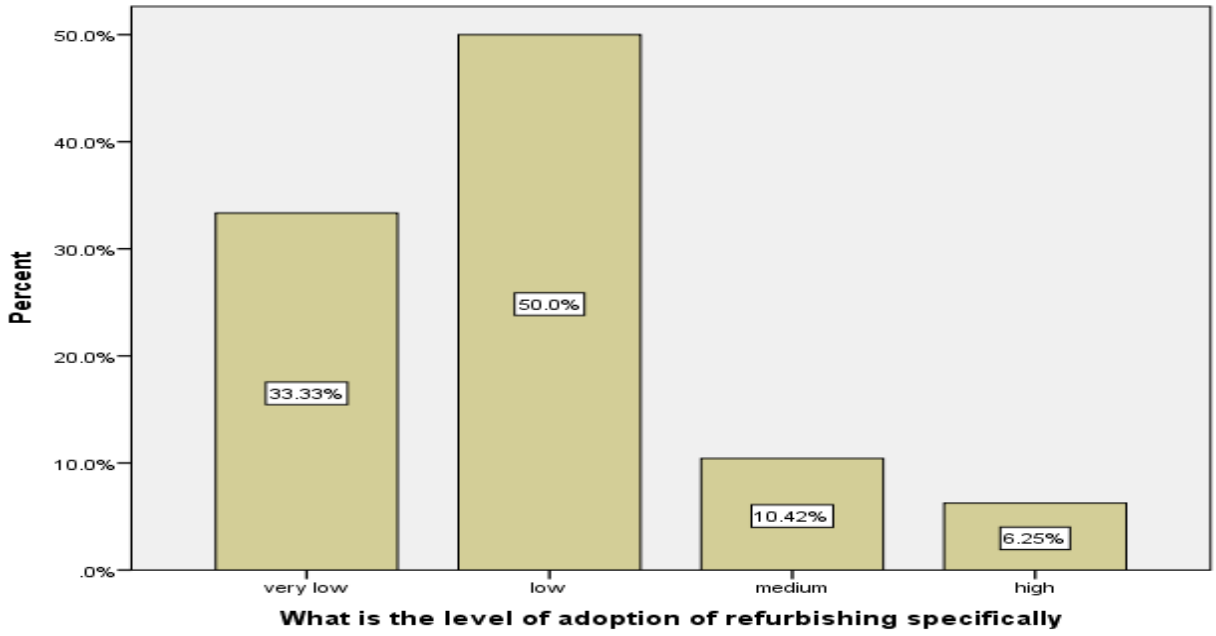
Graph 4.2.3

From the above graph the level of remanufacturing the highest percent is very low (37.5%) and low (33.33%), the medium is 22.92% and the highest level of remanufacturing on companies is 6.25%.this implies that majority if the companies are not engaged in the process.



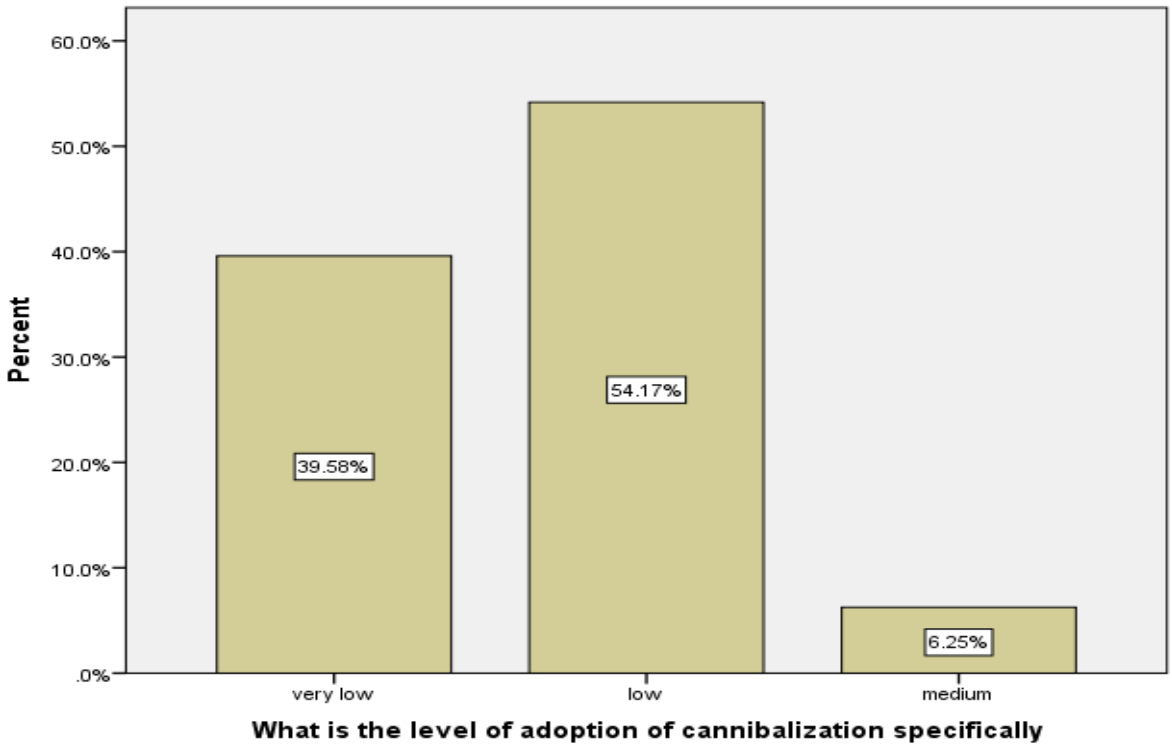
Graph 4.2.4

As the graph shows above the level of repair which is fixing the broken or the damage parts in almost many company is low and very low (37.5% and 45.83%) the practices found in medium level which is 16.67%.thus the highest portion of this chart is low from the total respondents of the companies majority of them are not repairing the product while in the process or even after processing they just use the raw materials to produce again this leads to incurred cost the company.



Graph 4.2.5

As shown in the graph the level of improving the product by adding something on it is fall between low and very low which is 50.0% and 33.33%.which explain that majority of the respondents of the company are not trying to improve the existing product but using it or rejecting as it is appear the sum of the low and very low percent is the highest proportion which dominate the others.



Graph 4.2.6

As shown on the graph the majority of the respondents reply on the levels of cannibalization of the items from the wastes or the damaged ones are low and very low which is 54.17% and 39.58% respectively. This means that from the graph the greatest portion is the low level of the respondents as it is stated on above and followed by very low.

Challenges on implementation of reverse logistics practices

i. Lack of policy instruments

Table 4.3.1

policy is not included on the strategic plan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	10	20.8	20.8	20.8
	Agree	34	70.8	70.8	91.7
	strongly agree	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

The majority of the respondent agree on policy is not included on the strategic plan of the company the response rate is 70.8% thus it implies that most of plastic companies are not using the policy as guideline.

Table 4.3.2

no simple procedure and guideline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	5	10.4	10.4	10.4
	Neutral	8	16.7	16.7	27.1
	Agree	33	68.8	68.8	95.8
	strongly agree	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

According to the respondents 68.8% of them are agreed with the concept of there is no available procedure and guideline in relation to reverse logistics practice which explain how to use and what procedure to use thus more than half of them are agreed.

Table 4.3.3

no rules and regulations regarding how to recondition the used products and packages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	9	18.8	18.8	18.8
	Disagree	17	35.4	35.4	54.2
	Neutral	4	8.3	8.3	62.5
	Agree	18	37.5	37.5	100.0
	Total	48	100.0	100.0	

The response for the company's rules and regulations are 37.5% agree regarding how to recondition the used products and packages, 35.4% disagree and strongly disagree 18.8% it implies majority of the company have their own rules and regulations on how to recondition the used products and packages.

ii. High initial cost

Table 4.3.4

The practice requires high cost to setup

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	9	18.8	18.8	18.8
	Disagree	18	27.1	27.1	56.3
	Neutral	8	16.7	16.7	72.9
	Agree	13	37.5	37.5	100.0
	Total	48	100.0	100.0	

From the total of the respondent 37.5% of them are agree on the practice requires high cost to setup, 27.1% are disagree and 18.8% are strongly disagree.

Table 4.3.5

current costs of reverse logistics affects the revenue

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	33	68.8	68.8	68.8
	Neutral	4	8.3	8.3	77.1
	Agree	11	22.9	22.9	100.0
	Total	48	100.0	100.0	

The 68.8% of the respondent are disagree with the current costs of reverse logistics affects the revenue of the firm and 22.9% are agree because those are using the practices as it is discus on the literature reverse logistics has its own cost.

Table 4.3.6

iii. **lack of collaboration with partners in reverse logistics practice**

lack of collaboration with partners in reverse logistics practice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	3	6.3	6.3	6.3
	Disagree	14	29.2	29.2	35.4
	Neutral	5	10.4	10.4	45.8
	Agree	21	43.8	43.8	89.6
	strongly agree	5	10.4	10.4	100.0
	Total	48	100.0	100.0	

The collaboration of the partners on the company response percent rate is 43.8% and 10.4% approximately 54.2% the sum of agree and strongly agree which is more than half so it implies there is lack of collaboration between partners.

iv. **lack technical capability**

Table 4.3.7

Employees lack technical capability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	4	8.3	8.3	8.3
	Disagree	11	22.9	22.9	31.3
	Neutral	1	2.1	2.1	33.3
	Agree	32	66.7	66.7	100.0
	Total	48	100.0	100.0	

The technical capabilities response rate is 66.7% which implies there is lack of technical capabilities the reason is that if the practices are not familiar with employee from the previous tables and graphs can have such kinds of implication.

Table 4.3.8

lack of knowledge about the reverse logistics concepts and its benefits

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	3	6.3	6.3	6.3
	Disagree	12	25.0	25.0	31.3
	Neutral	13	27.1	27.1	58.3
	Agree	20	41.7	41.7	100.0
	Total	48	100.0	100.0	

The response rate for agree is 41.7% greater than others and disagree is 25.0% thus from this the implication is the employees are not well informed about the reverse logistics practice and concepts this implies also they couldn't know about the benefits at the same time.

v. Lack of technology in the company

lack of technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	10	20.8	20.8	20.8
	Disagree	7	14.6	14.6	35.4
	Neutral	6	12.5	12.5	47.9
	Agree	23	47.9	47.9	95.8
	strongly agree	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Table 4.3.9

The technology in the companies is different from one another as the table indicate agree and strongly agree are 47.9% and 4.2% respectively so the conclusion lay on there is lack of technology in most of the company.

vi. Misunderstanding the importance of reverse logistics

Table 4.3.10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	10	20.8	21.3	21.3
	Disagree	31	64.6	66.0	87.2
	Agree	1	2.1	2.1	89.4
	strongly agree	5	10.4	10.6	100.0
	Total	47	97.9	100.0	
Missing	System	1	2.1		
Total		48	100.0		

Benefits of reverse logistics

This table shows that more than half of the respondent's strongly disagree and disagree 64.6%and 20.8% it implies that many of the company understanding the benefit of reverse logistics practices in the organization but not benefited from the practices of reverse logistics the reason behind as it is clearly showed on the above graphs and tables it is possible to conclude that level of implementation of practices of reverse logistics is very poor.

As the researchers get information from the ministry of environmental protection and forest there is no specification of low about the plastic manufacturing companies which enforce them to use the practices of reverse logistics in order to protect the environment from wastage of companies' product. This is because the concepts of reverse logistics is new and in infant level in our country

Environmental problems in Ethiopia are a constraining factor for sustainable development and improvement of people's livelihoods. Key environmental problems include climate change, soil degradation and deforestation. Agricultural production is severely affected by land degradation and both land degradation and deforestation have serious effects on biodiversity and ecosystem services. Continued climate change is expected to increase climate variability and the incidence of extreme weather events (e.g. droughts, floods) which will further degrade the country's ecosystems. Although Ethiopia has made some improvements concerningenvironmental health

during the last years it is still among the countries in the world with the lowest performance regarding indoor air pollution and water quality in terms of effects on human health. Poverty-environment linkages are apparent and major concerns include poor environmental health related to malnutrition, polluted water and indoor air pollution; vulnerability to natural disasters and climate change; tenure insecurity for land and other natural resources; and unreliable access to food and water.

The main drivers behind Ethiopia's environmental degradation include the high population growth, high urbanization rates as well as a rapid economic growth that is largely driven by agricultural production, infrastructure expansion and increasing energy demand. Furthermore, institutions have insufficient capacity to prevent and manage the major environmental issues, and there are gaps between political environmental commitments and actual implementation to improve environmental outcomes.

Although capacity is still limited, the Ethiopian government has shown considerable political will regarding its environmental problems, by e.g. establishing environmental protection agencies at federal level and in all regional states, as well as formulating various environmental proclamations and ratifying important environmental conventions, and promoting environmental investments. Benefits of building resilience can be seen in Ethiopia's Productive Safety Nets Programme (PSNP). Furthermore, the land registration and certification process in four regions have increased tenure security and investments in land. It has also promoted sustainable land management by pursuing various soil and water conservation technologies in agricultural lands, and natural resources management more generally.

CHAPTER FIVE

5. Summary, finding, conclusion and recommendation

5.1 Summary and finding

The general objective of this research is to assess reverse logistics practice in relation to plastic manufacturing companies focusing on Addis Ababa Sub cities & to provide alternative recommendations for concerned participants.

Specific objectives are to assess the advantages of implementing reverse logistics practice, to assess the level of implementation of reverse logistics activities specifically, to investigate the participation of the companies engaging in manufacturing plastic materials, to identify the shortcoming of reverse logistics on plastic manufacturing companies.

To address the objective of the study the quantitative and qualitative method of research approach were used. According to Johnson, Onwuegbuzie, and Turner (2007:123), mixed method research is "the type of research in which a researcher or team of researches combines elements of qualitative and quantitative research approach (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration".

As finding shows majority of employees are male and on the level of education more than half of the respondents have first degree and above and 51.1 percent of the respondents are found range between 26 and 35 which implies that they are more productive. About product reconditioning and reuse most of the companies are not engaged on the process. And many of the companies have at least one of the reverse logistics activates which makes similar almost all companies.

About gathering and handling items that are out of use in different reason more than half of the companies are not dealing with it only 18.8 percent of the companies are dealing with in relation the benefited companies are about 29 percent it helps to decrease costs for raw materials. On the other hand the level of implementation of reverse logistics in each and every activities of it from the respondents is the highest percent is covered by low and very low.

Regarding cost associated problems of reverse logistics; it was found that lack of awareness of the hidden cost of reverse logistics was the main problem experienced. High cost associated with reverse logistics was also perceived to be a major problem. The respondents indicated that the failure to reduce cost was also a problem, but to a moderate extent. From the results it is clear that the cost associated with reverse logistics was indeed perceived to be a problem.

In terms of problems relating to information systems, it was found that insufficient, ambiguous or conflicting data tended to be perceived to be the primary problem. The second main problem was insufficient investment in information technology, which was also perceived to be a major problem. The results indicated that information-related problems in reverse logistics were indeed problems that the organization experience.

The greatest obstacles relating to organizational and management related problems were perceived to be a lack of top management commitment to reverse logistics, lack of departmental collaboration and resistance to change to include reverse logistics. Not including reverse logistics in strategic planning and lack of top management awareness of the importance of reverse logistics was also perceived to be a major problem, but to a moderate extent. The results indicated that organizational and management-related problems were indeed perceived to be a problem in the organization.

5.2 Conclusions

In the course of conducting the actual study questionnaire and interview were used. From the total 73 questionnaire distributed 48 were returned from which 3 were not correctly filled and rejected. Therefore 48 were effectively used for analysis based on the finding from frequency statistics majority of respondents were male (68.8%). Concerning education level most of the respondents had university education (first degree).about the age 26-35 age group is the majority which is productive age group. Regarding the level of experience about 47.9% are in the range of 6-10 years so that means they have better knowledge and experience.

From the findings, the majority of plastic companies are not engaged in reverse logistics activities. Even though some of the companies which are involved in the practice are not fully implement all reverse logistics components. Regarding the level of implementation of reverse

logistics, it can be conclude that it is at rudimentary stage and not well entertained by the plastic companies. Lack of incorporating reverse logistics related policy framework in to the company's activities, lack of technologies, lack of employee technical capability, misunderstanding of the importance of reverse logistics and its high initial cost are some of the major challenges that hinder the practice of reverse logistics in plastic manufacturing companies. Thus from the tables and the graphs above from previous chapter it is possible to conclude the concepts of reverse logistics the level and implementation and benefits have been ignored in most of the companies plus it is not on the satisfactory level of progress.

As it is stated on chapter two the benefits of using reverse logistics companies who uses a well-developed reverse logistics section are much more likely to successfully restore returned products to their manufacturing or wholesales facilities, where they will potentially gain revenue from secondary sales or mass sale to secondary channels of distribution.

Another additional value that can be realized from more efficient take-back logistics is a decrease in the cost of the goods that are sold to consumers. In addition to raw materials and manufacturing costs, a product cost includes overhead costs, which can include potential handling costs, which can include potential handling costs if a product is returned by making the companies reverse logistics more effective, these overhead cost can be decreased, which would decrease the overall cost of goods, and increase profits from revenues as well.

5.3 RECOMMENDATIONS

- ✓ As the findings show that adoption of the reverse logistics practices is poor, the company should include reverse logistics in their strategic planning and create clear policies for it.
- ✓ Companies should invest in appropriate technology and establish effective data collection to improve the effectiveness of their reverse logistics processes.
- ✓ The government should enforce by low the companies who are engaged in plastic manufacturing.
- ✓ Companies should give training for employees to improve their technical capability in relation to reverse logistics practices.
- ✓ Companies should use the used product again in order to prevent the foreign currency for raw materials.

- ✓ In order to do the above companies should have a strategy plan how to collect the items from customers by creating a chain or a connection.
- ✓ Interdepartmental or team sprit relationship should be developed as they are engaged inresponsibilities to achieve the same final goal. A good level of communication, team work, integration and mutual understanding shall be developed besides, a clear division of task and a common information pool towards to the concerned staff to be implemented.
- ✓ In order to enhance the capacity the employees the organization ensure the arrangementof benchmarking among different offices , the staff exceed performance with the currentlevel like incentive scheme and rewards to motivate employees with in the unit .

Further studies should be conducted on the key determinants and drivers of reverse logistics.

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Appendix

Addis Ababa University School of Commerce

Master of Art in Logistics and Supply Chain Management

Questionnaires on "The assessment of reverse logistics on plastic manufacturing companies"

Dear respondent, I thank you in advance for your cooperation, and honesty answering the following questions.The aim of collecting information through this questionnaire is to conduct a research on "assessment of reverse logistics on plastic manufacturing companies located in Addis Ababa" for the requirement for partial fulfilment of my MA degree in Logistics and Supply Chain Management. The data to be collected will help me to judge reverse logistics practice, identify major barriers and give recommendation that will eliminate or minimize those barriers identified.

In order to make the research outcomes complete, your reliable, genuine and accurate response to each item will have decisive contribution. Therefore, you are kindly requested to respond to each item frankly and accurately. The researcher will like to assure you that, the information you provide me will be kept confidential and shall only be used for the purpose of academics.

Dear respondents! Please note that:

- You do not need to write your name on the questionnaire
- You need to respond to all of the research questionnaire
- You should not assign other respondents to fill it

Put right (√) mark inside the box provided next to each question

In case of any question or dilemma please contact me via phone: 0910974336

Thank you in advance for your cooperation!!!

Part One: General information

1 Gender

☐ **Male** ☐ **Female**

2 Age

☐ **18-25** ☐ **36-45** ☐ **56 and above**

☐ **26-35** ☐ **46-55**

3. Level of education

☐ **Diploma** ☐ **Masters**

☐ **Degree** ☐ **PhD**

4. years of experience

☐ **0-5years** ☐ **11-15year** ☐ **21 and above**

☐ **6-10 years** ☐ **16-20years**

Part one: practices of reverse logistics

1: strongly disagree 2: disagree 3: neutral 4: agree 5: strongly agree

		1	2	3	4	5
1	There is no formally defined reverse logistics practice relating to product recondition and reuse					
2	The company engaged at least one of the practise of reverse logistics activities					
3	The company gather and handle items that are out of use in different reasons from both the internal and external customers					
4	The company distribute the items that are collected previously					
5	The company inspection and select limited amounts of parts from the collected used products, so as these parts can be reused in remanufacturing, refurbishing or repairing recovery activities.					
6	The company is benefited from the practise of reverse logistics					
7	The company is disadvantageous from the practise of reverse logistics					
8	The company collects returned products from the consumer for further process and recapture value					
9	The company has appropriate reverse logistics system					

Part two: to assess the level of reverse logistics implementation in plastic manufacturing companies

1. What is your level of awareness and knowledge about the concept of reverse logistics?

Very low ☐ low ☐ medium ☐ high ☐ very high ☐

Level of reverse logistics adoption

		Very low	low	medium	high	Very high
1	What is the level of adoption of reuse specifically					
2	What is the level of adoption of recycle specifically					
3	What is the level of adoption of remanufacture specifically					
4	What is the level of adoption of repair specifically					
5	What is the level of adoption of refurbishing specifically					
6	What is the level of adoption of cannibalization specifically					

Part three: challenges of reverse logistics

1: strongly disagree 2: disagree 3: neutral 4: agree 5: strongly agree

		1	2	3	4	5
1	The reverse logistics policy is not included on the strategic plan of the company					
2	The company incurred higher cost in relation to reverse logistics activities					
3	The current costs of reverse logistics affects the revenue of the firm					
4	There is no information system used to facilitate the reverse logistics practice of the company					
5	Most of the time there is lack of collaboration with partners in reverse logistics practice					
6	Employees lack technical capability					
7	The practice requires high cost to setup					
8	There are barriers in implementation of effective reverse logistics in the company					
9	Most of the time the products are unfriendly to the environment					

10	There is no simple procedure and guideline					
11	There is lack of technology in the company					
12	There is a lack of knowledge in the company employees about the reverse logistics concepts and its benefits					
13	There is no rules and regulations in the company regarding how to recondition the used products and packages					
14	Not clearly understanding the benefit of reverse logistics practice in the organization					

Is there any additional major barriers to be mentioned which adversely affect reverse logistics practice?----------
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Thank You!