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**SCHOOL OF POSTGRADUATE STUDIES**

FINAL THESIS REPORT

**ANALYZING THE EFFECTS OF IMPLEMENTING REVERSE LOGISTICS ON THE  
PERFORMANCE OF BEVERAGE MANUFACTURING FIRMS IN ZAMBIA: A CASE OF  
ZAMBIAN BREWERIES PLC.**

**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES,  
UNIVERSITY OF LUSAKA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE  
MASTER OF SCIENCE IN PROCUREMENT, LOGISTICS, AND SUPPLY CHAIN  
MANAGEMENT.**

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## DECLARATION

This dissertation as stated above is therefore declared by me, Peter Kalamwa. The outcome of my own independent investigation is "A case study of Zambian Breweries Plc." Unless otherwise noted, all the ideas and substance in this dissertation are all mine. I have correctly cited and recognised all my information sources using the accepted academic referencing style. This dissertation has not been submitted for consideration for any other degree or certification at any other university, and all the data and information utilised in the study are authentic and ethically gathered. I certify that this work is completely original and that I am aware of the negative effects of plagiarism.

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## **DEDICATION**

I dedicate this dissertation to my family (my wife Susan, my son Peter Junior, and my daughters Faith and Abigail), whose unwavering support and encouragement have been my pillars of strength throughout this academic journey. Their belief in my abilities has been a constant source of motivation, and I am grateful for their sacrifices and understanding during the challenging times of this research. This work is a tribute to their love and resilience, without which this achievement would not have been possible. Lastly, I dedicate this dissertation to my late Dad and Mum (Mr. & Mrs. Kalamwa) for their prayers about my life and future being and their wish to see me exceling in my academic journey. May their Souls Rest in Peace.

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## ABSTRACT

Reverse logistics implementation can assist beverage manufacturing companies cut waste and improve supply chain efficiency as it allows them to recover, reuse and recycle materials that would otherwise be thrown away thereby contributing to positive environmental sustainability. Zambian Beverage manufacturing firms had contributed to environmental impact negatively due to limited understanding and lack of analysis of how reverse logistics implementation affects their firm's performance. The purpose of this study was to analyse how reverse logistics implementation affects Zambian beverage manufacturing companies' performance. The study had four objectives which were to ascertain how recycling management affects Zambian beverage manufacturing companies' performance, to examine how product remanufacturing affects that performance, to determine how product repackaging affects that performance and to identify the obstacles Zambian beverage manufacturing companies face when trying to implement efficient reverse logistics procedures.

The study employed a quantitative research approach and a descriptive research design. A target population of 838 Zambian breweries employees from various departments were targeted and using Yamani sample size formula, a sample size of 271 participants were computed. The survey questionnaires were used to collect primary data from 271 participants which was subsequently analysed through regression analysis with the aid of SPSS v27, and Microsoft excel 2016 for data coding.

The study findings showed compelling evidence indicating a significant and positive relationship between the implementation of reverse logistics strategies and the enhanced performance of beverage manufacturing companies in Zambia. However, lack of infrastructure and collection systems, regulatory and compliance hurdles, logistical intricacies, technological barriers, resistance to behavioural change, and financial constraints were the main obstacles identified affecting the implementation of reverse logistics procedures among beverage manufacturing firms in Zambia.

In line with this study's findings, the researcher recommended that Zambian Breweries and other industry players need to adopt reverse logistics strategies due to its positive and significant effect on the firm's performance and environmental sustainability. There is need for substantial investment in the main obstacles identified in the study that hinders the implementation of reverse logistics among beverage firms in Zambia. Future research may focus on other factors besides recycling, remanufacturing, and repackaging to understand the unexplained variation in beverage firms' performance.

**Keywords: Reverse Logistics, Manufacturing, Performance, Challenges, Recycling, remanufacturing, repackaging**

# CHAPTER ONE

## INTRODUCTION

### 1.0 Introduction

A growing number of people are realizing the value of reverse logistics in supply chain management as part of the global shift towards sustainable development (Govindan et al., 2015). Businesses that produce beverages are vital to Zambia's economy because they boost investment, jobs, and GDP (Zambia Development Agency, 2019). Nonetheless, these businesses struggle to effectively manage their logistics operations in a market that is becoming more and more competitive (Mwanza & Mbohwa, 2017). The application of reverse logistics is one strategy that has drawn interest recently (Agrawal et al., 2015).

Reverse logistics refers to 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 (Rogers & Tibben-Lembke, 1999). Implementing reverse logistics can help companies reduce waste, improve resource utilization, and enhance their environmental and financial performance (Agrawal et al., 2015; Govindan et al., 2015).

While considerable research has been done on reverse logistics in developed countries (Govindan et al., 2015), not much has been done to examine its effects in the context of developing nations like Zambia (Mwanza & Mbohwa, 2017). Thus, by investigating the effect of reverse logistics implementation on the performance of beverage manufacturing companies in Zambia, this study seeks to address this research gap. Understanding the implications of reverse logistics can help businesses make informed decisions about their supply chain strategy and potentially improve their overall performance (Agrawal et al., 2015).

This chapter introduces the research with a background overview, defining the existing statement of the problem, stating the objectives in two part (i.e., general, and specific),

research questions and hypothesis, outlining the study boundary and focus, and highlighting the significance of the study while defining key terms that guide the direction of the research.

### **1.1 Background to the study**

The brew business is one of the largest around the globe and most competitive markets. Beverage manufacturing companies face several challenges in their pursuit of sustainability and profitability, including growing competition, evolving consumer tastes, and environmental regulations. As such, beverage companies have integrated reverse logistics into their supply chain management. Cruz-Rivera et al. (2018) claim that one such environmentally beneficial strategy that can assist beverage producers in cutting waste, maximising resource utilisation, and raising profits is reverse logistics.

In beverage production organisations, reverse logistics is used to describe the process of collecting empty drink containers, packaging, and other parts that can be recycled or used again. The impact of environmental and community stakeholders on organisational performance is acknowledged by the stakeholder theory. Zambian beverage manufacturing companies may have to contend with mounting demands to reduce their environmental footprint and make meaningful contributions to the community. Businesses may use sustainable practices in reverse logistics, such reducing carbon emissions by optimising transportation routes or promoting local communities through ethical sourcing and distribution methods. Fulfilling these expectations can improve long-term sustainability, reputation, and public perception (Rakesh and Bhupendra, 2018).

The financial performance of beverage manufacturing enterprises can also be improved via reverse logistics. Based on a 2020 study by Hua et al., organisations' financial performance benefits from reverse logistics deployment. Reverse logistics adoption can lead to lower costs, more revenue, and happier customers, claims the paper. Since more consumers are interested in purchasing products made ethically and environmentally, reverse logistics can aid beverage producers in increasing their market share.

Environmental sustainability also benefits from reverse logistics. In addition to reducing greenhouse gas emissions, water and energy consumption, and energy usage, reverse

logistics can improve environmental sustainability. Reverse logistics can also be used to create a circular economy, which is an economic structure founded on the ideas of sustainability and resource conservation (Meidut-Kavaliauskien and aparauskas, 2020). In modern times, Reverse logistics however, have been found with the evidence to help firms in cutting waste and improving the efficiency of their supply chains, as demonstrated by literature on beverage manufacturing companies. Bhupendra and Rakesh (2018) conducted a study on reverse logistics and discovered that reserve logistics might cut waste produced by beverage manufacturing companies by a significant amount. Reverse logistics helps beverage firms maximise their resource utilisation by recycling and reusing items that would otherwise be thrown away.

The implications of reverse logistics in the beverage industry have been extensively studied, but not much of it has been done locally. It is very important to conduct research to find out how local beverage manufacturing companies use reverse logistics and how it impacts their bottom line. If beverage companies are aware of the opportunities and limitations of using reverse logistics locally, they can develop more effective and sustainable supply chain management strategies. Furthermore, it can help legislators draft policies and regulations that motivate the beverage sector to use sustainable practices.

### **1.1.1 Zambian Breweries Plc**

Zambia Breweries Plc, founded in 1963, boasts a rich legacy in the Zambian brewing industry, where it has an essential role in the development of the country. As a subsidiary of Anheuser-Busch InBev (AB InBev), one of the world's foremost brewing conglomerates with a global presence and an extensive range of beer brands, Zambia Breweries is deeply rooted in Zambia's beverage industry (Zambian Breweries 2022).

This company stands as a leading force in Zambia's brewing sector, boasting multiple breweries strategically positioned throughout the nation. Its extensive distribution network blankets the entire country, ensuring widespread availability of its products. Typically, Zambia Breweries commands a substantial share of the Zambian beer market, a testament to its prominence and market influence. To power its operations and maintain

its market standing, Zambia Breweries relies on a sizable and dynamic workforce. At the helm of Zambia Breweries, a dedicated management team comprises executives and professionals responsible for overseeing every facet of the business. From production and marketing to sales and corporate affairs, this team ensures the company's continued growth and success (Zambian Breweries 2022).

Zambia Breweries boasts a diverse product portfolio that spans both alcoholic and non-alcoholic beverages. Among its well-recognized beer brands are Mosi Lager, celebrated for its popularity in Zambia, Castle Lite, distinguished for its lighter and invigorating taste, Eagle Lager, another beloved choice among Zambian consumers, and Chibuku Shake-Shake as well as Chibuku Super packaged in PET containers under National Breweries Plc, a traditional and widely enjoyed opaque beer in Zambia. Beyond beer, Zambia Breweries also produce non-alcoholic beverages, including soft drinks in returnable glass bottles (RGB) and Non-returnable plastic containers (PET) under Coca-Cola Brand Name and Trademark, further expanding its footprint in Zambia's beverage market (Zambian Breweries 2022).

## **1.2 Background to the statement of the Problem.**

In addition to the intense rivalry in the market, companies in the manufacturing sector are always searching for ways to enhance internal operations and customer satisfaction. Reverse logistics has consequently gained popularity as a technique that many companies employ to boost productivity. The manufacturing sector is an essential component of every economy since it creates revenue and has direct links with every other sector. The Imran group (2012). Despite its importance, a variety of barriers prevent the industrial sector from reaching its full potential.

Zhang Yu et al. (2018) emphasized that reverse logistics has been a critical component of green supply chain strategies that can be utilised to raise an organization's performance. Though it's an often-used tactic in other parts of the world economy, not much is known about reverse logistics' use in Zambia. Effective reverse logistics management, according to Sharma et al. (2016), can increase an organization's profitability, customer happiness, and societal advantages.

A considerable number of experiential studies have looked at sustainability initiatives, particularly when it comes to reverse logistics in industrial businesses. Some studies, like those by Rao and Holt (2005), Green et al. (2012), and Runala and Zaffar (2015), have found a link between environmental practices and organisational performance; however, other studies, like those by De Giovanni and Esposito Vinzi (2012) and Huang et al. (2012), not discovered any convincing proof of a connection. There is disagreement among the studies that are currently available due to a lack of local context-specific research, it raises questions about how reverse logistics affects business success, especially for small enterprises that don't have baseline data to compare against.

Failure to implement reverse logistics by beverage manufacturing firms in Zambia has contributed negatively to the environmental impact of the Nation hence leaving most of Zambian towns with a lot of wastes composed of beverage packaging containers and materials without proper disposal and collection systems.

Beverage manufacturing firms in Zambia faced with shortage of raw materials and production disruption which has resulted into failure to meet customer demand like in the case of Zambian Breweries where weekly production volume cannot be met due to shortage of packaging material of glass bottles pointed to lack of effective implementation of reverse logistics as the Company was found to be highly dependent on new raw material of glass bottles injection sourced from Tanzania and South Africa hence delayed on raw materials delivery as a result of supply chain disruption.

This was supported by the physical evidence in which there was a lot of beverage packaging containers and materials such as plastics, PET containers like those used to package soft drinks, water, glass bottles for clear beer and carton boxes for Chibuku shake-shake opaque beer across many towns in Zambia.

Consequently, it's critical to examine the ways in which reverse logistics implementation impacts the operational efficacy of Zambian beverage producers and identify the factors that drive their adoption. This study intends to narrow this gap by analysing the effect of reverse logistics deployment on the performance of beverage manufacturing enterprises in Zambia and addressing relevant obstacles faced during implementation.

### **1.2.1 Statement of the problem**

Zambian Beverage manufacturing firms have contributed to environmental impact negatively due to limited understanding and lack of analysis of how effective reverse logistics implementation affects their firm's performance.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective.**

To analyse the effects of implementing reverse logistics on the performance of beverage manufacturing firms in Zambia: a case study of Zambian Breweries Plc.

#### **1.3.2 Specific Objectives.**

1. To ascertain how recycling management influences the performance of beverage manufacturing companies in Zambia.
2. To examine the impact of product remanufacturing on Zambian beverage manufacturing companies' performance.
3. To determine how product repackaging affects Zambian beverage manufacturing companies' performance.
4. To identify the challenges faced by beverage manufacturing firms in Zambia when putting into operation efficient reverse logistics procedures.

### **1.4 Research Question**

1. How does recycling management affect Zambian beverage manufacturing companies' performance?
2. What effect does product remanufacturing have on Zambian beverage manufacturing companies' performance?
3. How does product repackaging affect Zambian beverage manufacturing companies' performance?
4. What challenges do Zambian beverage manufacturing companies faced when putting into practice efficient reverse logistics procedures?

### **1.5 Study Hypotheses**

The following general hypothesis will serve as the study's guide:

### 1. Recycling Management:

**H01:** There is no statistically significant relationship between recycling management and the performance of beverage manufacturing firms in Zambia.

**Ha1:** There is a statistically significant relationship between recycling management and the performance of beverage manufacturing firms in Zambia.

### 2. Product remanufacturing

**H02:** There is no statistically significant relationship between product remanufacturing and the performance of beverage manufacturing firms in Zambia.

**Ha2:** There is a statistically significant relationship between product remanufacturing and the performance of beverage manufacturing firms in Zambia.

### 3. Product repackaging

**H03:** There is no statistically significant relationship between product repackaging and the performance of beverage manufacturing firms in Zambia.

**Ha3:** There is a statistically significant relationship between product repackaging and the performance of beverage manufacturing firms in Zambia.

## **1.6 Significance of the study**

This study is significant because it might broaden our understanding of the ways in which reverse logistics impacts the output of beverage manufacturing enterprises in Zambia. By putting the study's findings into practice, Zambian beverage producers may enhance their operations and reverse logistical processes. It is hoped that the results would provide insightful information that can direct policymakers, industry stakeholders, and Zambian Breweries PLC towards more environmentally friendly and performance-driven business practices. Additionally, the study might help the beverage manufacturing firms to understand the obstacles faced during reverse logistics implementations and how to handle them to ensure efficient and effective implementation of reverse logistics.

## **1.7 Scope of the Study**

The study concentrated on Zambian Breweries. All other possible influences will be excluded from the study, which will only consider the effect that reverse logistics adoption has on these organisations' performance.

## **1.8 Operational Definition of key terms.**

**Reverse logistics:** The method of organising, carrying out, and overseeing the movement of inventory, finished items, raw materials, and associated information from the point of consumption back to the origin in an economical and effective manner to preserve value or ensure proper disposal (Almeida and Souza, 2017).

**Performance:** The extent to which an organisation meets its goals as determined by metrics that encompass both monetary and non-monetary aspects, like profitability, efficiency, longevity, and client contentment (Faria et al., 2017).

**Financial performance:** Capacity of an organisation to produce earnings and cash flows and optimise shareholder value via efficient financial resource management Faria and associates (2017).

**Environmental sustainability:** The process of reducing how much a company's operations harm the environment and protecting natural resources for next generations.

**Recycling management:** The management of recyclable material collection, sorting, and processing to create new goods (Chiu et al., 2018).

**Product remanufacturing:** Remanufacturing old products to their original specifications involves taking them apart and putting them back together (Sundin and Bras, 2005).

**Product repackaging:** A product's packaging can be changed or replaced to increase its marketability or environmental performance Graedel et al., 2011).

## **1.9 Chapter one summary**

The chapter outlined in detail the introduction, background of the study, background to the statement of the problem, statement of the problem. It also highlighted the research objectives in two parts (i.e., general, and specific) and research questions that guided this research. The chapter also presented the research hypothesis, scope, and significance of the study, highlighting its potential to provide valuable insights and recommendations for the successful implementation of reverse logistics practices in the Zambian beverage

manufacturing industry. The chapter concluded by defining key terms related to reverse logistics and supply chain management.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0. Introduction

This chapter provides a comprehensive review of the existing literature on reverse logistics and its effect on the performance of beverage manufacturing companies. The review covers historical background, theoretical models, conceptual frameworks, and empirical research in reverse logistics and its effects on business performance. The aim is to identify key themes, debates, and gaps in the current knowledge, setting the stage for the present study.

#### 2.1. Historical Background

##### 2.1.1. The Evolution of Reverse Logistics

The concept of reverse logistics has evolved over time, with early mentions dating back to the 1970s. Zikmund and Stanton (1971) were among the first to discuss the notion of "reverse distribution," focusing on the role of recycling and waste management in supply chain operations. In the 1980s, the term "reverse logistics" gained more prominence, with researchers exploring its implications for various industries (Murphy, 1986; Lambert and Stock, 1987). The 1990s saw a growing interest in the environmental aspects of reverse logistics, as concerns over sustainability and eco-efficiency became more pressing (Carter and Ellram, 1998; Fleischmann et al., 1997). In the 2000s and beyond, reverse logistics has become an integral part of supply chain management, with increasing recognition of its strategic importance in terms of cost reduction, customer satisfaction, and environmental responsibility (Rogers and Tibben-Lembke, 2001; Guide and Van Wassenhove, 2009).

##### 2.1.2. Reverse Logistics in the Beverage Industry

The beverage industry has been at the forefront of reverse logistics implementation, driven by the need to manage product returns, recycling, and reusable packaging (Goldsby and Closs, 2000; Triantafyllou and Cherrett, 2010). Historically, the focus has been on the recovery and reuse of glass bottles, which have been a staple of the industry for decades (Ashby, 2018). With the advent of plastic packaging and the increasing

emphasis on sustainability, beverage companies have had to adapt their reverse logistics strategies to encompass a wider range of materials and processes (Coelho et al., 2011; Matar et al., 2014). The industry has also faced challenges related to the collection and sorting of post-consumer waste, as well as the need to engage with consumers and other stakeholders to promote recycling and reduce littering (Rousta et al., 2015; Troschinetz and Mihelcic, 2009).

### **2.1.3. Reverse Logistics in Developing Countries**

While much of the early research on reverse logistics focused on developed countries, there has been growing interest in its application in developing countries in recent years. These countries often face unique challenges, such as limited infrastructure, informal waste collection systems, and lack of public awareness (Kinobe et al., 2015; Lohri et al., 2017). However, there is also recognition of the potential benefits of reverse logistics in terms of job creation, resource conservation, and environmental protection (Mwaura et al., 2015; Oyake-Ombis et al., 2015). In the African context, studies have explored the opportunities and barriers to implementing reverse logistics in various industries, including the beverage sector (Ongondo et al., 2011; Oke and Gopalakrishnan, 2009). These studies highlight the need for context-specific solutions that consider the socio-economic, cultural, and institutional realities of each country.

### **2.1.4 Inbound Logistics and Reverse Logistics**

While reverse logistics focuses on the backward flow of products and materials from the customer back to the manufacturer or recycling facility, it has strong linkages with inbound logistics as well. Inbound logistics refers to the movement of raw materials, components, and other inputs required for the production process from suppliers to the manufacturing facilities (Rushton et al., 2014).

An effective inbound logistics system is critical for enabling successful reverse logistics practices like remanufacturing and recycling. The quality, quantity, and timing of the inbound supply of materials impacts the viability of recovering value from returned products through remanufacturing. For example, if replacement parts or components are not readily available through inbound logistics, it hampers the ability to refurbish used products economically.

Moreover, the inbound provisioning of recycled materials directly affects the extent to which recycling can offset the need for virgin raw material inputs. A smoothly functioning reverse logistics channel to collect, sort and process recyclable waste creates a closed-loop system by feeding those materials back into inbound logistics for manufacturing (Agrawal et al., 2015).

Therefore, inbound logistics serves as the crucial link connecting reverse logistics activities and conventional forward logistics operations. An integrated approach coordinating all these bidirectional flows is required for manufacturing firms to maximize the sustainability benefits of circular production models (Govindan et al., 2015).

Leading companies have started adopting comprehensive closed-loop supply chain management that synergistically combines inbound, production, outbound, and reverse logistics. This allows them to better match supply with demand while capturing value from reuse/recycling and minimizing costs associated with waste disposal (Guide & Van Wassenhove, 2009).

In general, while reverse logistics is focused on the backward stream of used products and materials, its efficacy is heavily dependent on seamless integration with inbound logistics processes that supply the recovered resources back into production cycles. Optimizing this synergy between reverse and inbound logistics is vital for manufacturers striving to derive economic and environmental advantages from circular business models.

## **2.2 Empirical review**

For the last decade numerous studies on the implementation of reverse logistics in beverage manufacturing firms globally provide valuable insights into its effects on performance. This examination explores empirically reviews the literature within the decade (2012-2023) on the implementation of reverse logistics in beverage manufacturing firms.

### **2.2.1 Global Perspective Review:**

#### **2.2.1.1 Reverse logistics and Financial Performance**

Theoretically, Hua et al. (2020) set out to investigate the relationship between reverse logistics and financial performance. The data was examined using structural equation

modelling after a survey of 232 Chinese enterprises. The results of the study showed that a company's profitability, return on assets, and return on investment rose when reverse logistics were used. Reverse logistics may help firms become more financially successful by reducing costs, maximising the use of their resources, and retaining customers, according to the report.

The study conducted by Bhupendra and Rakesh (2018) sought to investigate how reverse logistics affected supply chain efficiency and waste reduction in the beverage manufacturing sector. They carried out a research of fifty Indian beverage manufacturing enterprises, and the findings were analysed using statistical techniques. The study's findings demonstrate that by using reverse logistics, businesses may lower waste and improve supply chain efficiency. For instance, reverse logistics can lower inventory levels, save down on transportation costs, and assist businesses recover goods and resources that would otherwise be thrown away. The study suggests that beverage manufacturing companies might boost their competitiveness and sustainability by implementing reverse logistics approaches.

Meidut-Kavaliauskien and Aparauskas found in their 2020 study on reverse logistics' impact on the circular economy that it is essential to a more sustainable business strategy. They argue that companies can use reverse logistics techniques to recover value from their waste materials and repurpose them into new products. This encourages the efficient use of resources and reduces the consumption of raw materials, two fundamental principles of the circular economy.

In a separate research, Soylu and Eskifrat (2018) examined the effect of reverse logistics on corporate operations. They found that effective reverse logistics practices may improve operational efficiency, reduce expenses, and increase customer satisfaction. Reverse logistics helps companies reduce waste and streamline their supply networks, which increases output while lowering expenses. Because reverse logistics makes it simpler for things to be returned and reused, it can also boost customer happiness and loyalty.

### **2.2.1.2 The influence of Recycling Management on beverage firm's Performance**

Yuan Liu et al.'s study conducted in 2019, titled "Evaluating the Employment Impact of Recycling Performance in Florida," ventured into the broader realm of recycling programs and their ramifications on employment dynamics, particularly within the recycling sector. Although the study did not specifically focus on the beverage industry, its insights shed light on the broader implications of recycling initiatives on job creation within the recycling domain.

The study's findings offered compelling insights, highlighting that the influence of recycling programs on employment opportunities predominantly manifested within the recycling processing sector. This implies that the employment impact of effective recycling management practices might be concentrated within specific segments of the recycling industry, particularly in processing activities. While the study didn't explore the nuances of job creation within the beverage manufacturing sector specifically, it did underscore the potential socioeconomic effects of robust recycling practices. It suggested that strategic and efficient recycling management, even in sectors beyond beverages, could contribute to job generation, especially in the operational realms linked directly to the processing and management of recyclable materials.

Additionally, a study by M. Ali et al. in 2019, titled "Impacts of Environmental Factors on Waste, Energy, and Resource Management and Sustainable Performance," explored the influence of waste, energy, and resource management on the sustainable performance of large manufacturing firms. While not limited to the beverage sector, the findings underscored the positive effect of waste, energy, and resource management on sustainable performance. This suggests that effective recycling management practices, as part of broader environmental efforts, can enhance the overall sustainability and performance of manufacturing firms, including those in the beverage industry.

Furthermore, T. Meng et al. in 2015 conducted a study titled "What Drives an Environmental Horticultural Firm to Start Recycling Plastics?" focusing on the environmental horticulture industry but offering relevant insights. The research investigated the determinants of recycling common types of plastic product waste. The findings indicated that factors such as firm size, motivation for recycling, current recycling

situation, and owner/manager education level influenced the decision to recycle plastics. While specific to horticulture, these findings imply that the proactive management of recycling practices, driven by various factors, can influence a firm's decision to engage in recycling efforts.

### **2.2.1.3 The influence of Product Remanufacturing on firms' performance**

The study titled “Economic and Environmental Assessment of Remanufacturing Strategies for Product + Service Firms” by Anton Ovchinnikov et al. (2014) employed a quantitative research approach and economic and environmental assessment methods to assess the impacts of remanufacturing strategies. While specific population details were not provided, it likely included a sample of product and service firms engaged in remanufacturing activities. Data collection instruments were likely a combination of economic assessment tools and environmental impact assessment methodologies, although specific instruments were not specified. Details about sampling techniques were not mentioned. Data analysis likely involved economic assessment methods to evaluate the financial implications of remanufacturing and environmental impact assessment methods to assess environmental effects. The findings suggested that remanufacturing aligns firms' economic and environmental goals by increasing profits and reducing environmental impact, implying a positive influence on financial and environmental performance. The study likely concluded that adopting remanufacturing strategies can yield economic benefits for firms while simultaneously reducing their environmental footprint.

The study titled “Capacity and Production Decisions under a Remanufacturing Strategy” conducted by Serra Caner Bulmus et al. in (2013) likely employed a quantitative research approach with a focus on assessing capacity and production decisions within the context of remanufacturing. The research design was centred around evaluating the cost-effectiveness of remanufacturing strategies. While specific population details were not provided, the population for this study would likely have included firms or industries considering the adoption of remanufacturing strategies, although the particulars of the population were not outlined. Data collection instruments likely revolved around

production and cost analysis, although precise instruments were not specified. Details regarding the sampling techniques employed were not provided.

The data collected was presumably analysed using quantitative methods, particularly cost analysis, and modelling, to assess the cost-effectiveness of remanufacturing. Although not specific to the beverage industry, the study may have found that remanufacturing is advantageous when it leads to cost savings in comparison to traditional manufacturing processes. Consequently, the findings may suggest that the profitability of remanufacturing is contingent on the specific circumstances and cost differentials. The study might have concluded that firms should prioritize remanufacturing in situations where it reduces costs, as this can contribute positively to overall performance.

The study titled “System Dynamics Modelling of a Production and Inventory System for Remanufacturing,” conducted by R. Poles et al. (2013), employed a research approach and design centred on system dynamics modelling. The primary focus was to evaluate a production and inventory system within the context of remanufacturing, with an emphasis on system-level analysis. While specific details about the population size were not provided, the population for this study would have included the system being modelled, which likely represented a production and inventory system for remanufacturing in a specific context.

The primary data collection instrument employed in this study was the system dynamics model itself, which simulated the behaviour of the remanufacturing system. Given the nature of system dynamics modelling, traditional sampling techniques were not applicable. The data analysis primarily consisted of using system dynamics modelling techniques to simulate the behaviour of the remanufacturing system and assess its performance under various scenarios. The findings likely revolved around the insights gained from the system dynamics model, shedding light on how changes in different parameters influenced the performance of the remanufacturing system. As a potential conclusion, the study may have inferred that system dynamics modelling holds significant potential for providing valuable insights into the performance of remanufacturing systems and guiding decision-making to enhance overall performance.

#### **2.2.1.4 The effect of Product Repackaging on Beverage Firms' Financial Performance**

Empirical investigations have examined the influence of product repackaging on the performance of beverage manufacturing firms. These inquiries offer valuable insights into the market response and firm-level effects of environmentally conscious packaging practices within the beverage industry. One such study conducted by P. Tsarouhas et al. (2013), titled "Evaluation of Overall Equipment Effectiveness in the Beverage Industry: A Case Study," assessed the overall equipment effectiveness (OEE) in the beverage industry. While not exclusively focused on repackaging, the study examined various aspects of beverage production, including packaging lines. The findings indicated the significance of OEE in assessing the efficiency of production processes, which can be influenced by packaging practices. This suggests that efficient product repackaging can contribute to improved production performance within the beverage industry.

Additionally, K. Grekova et al. (2016) conducted a study titled "How Environmental Collaboration with Suppliers and Customers Influences Firm Performance: Evidence from Dutch Food and Beverage Processors." Although not beverage-specific, the research investigated the influence of environmental collaboration, including packaging practices, on firm performance. The findings highlighted that collaboration with customers to implement sustainable process improvements could lead to cost savings and market gains. While broader in scope, these findings imply that environmentally conscious packaging practices, such as repackaging, can positively affect the performance of food and beverage processors.

Moreover, a study by C. Weiß et al. (2005), titled "Retailer Concentration and Product Innovation in Food Manufacturing," explored the impact of retailer market power on product innovation in the food manufacturing sector. While not specific to repackaging, the study revealed that retailer market power negatively affected product innovation. However, this effect could be mitigated if manufacturing firms possessed countervailing power. These findings suggest that innovative packaging practices, including

repackaging, may be influenced by the dynamics of market power and can impact a firm's overall performance.

#### **2.2.1.5 Challenges Faced by Beverage Manufacturing Firms in Implementing Effective Reverse Logistics Practices in Zambia**

The difficulties faced by beverage manufacturing companies while implementing efficient reverse logistics procedures have been the subject of empirical investigation. These studies offer helpful insights into the problems faced and suggest possible ways to get past these obstacles.

Global literature on challenges in implementing effective reverse logistics practices in beverage manufacturing firms offers a comprehensive understanding of the complexities involved. Research by Carter et al. (2016) reveals that one of the primary challenges is the lack of standardized processes, leading to inefficiencies in product recovery and recycling. Additionally, studies such as that by Zhang and Lee (2018) emphasize the difficulty in managing the reverse flow of materials due to the diverse nature of beverage packaging.

In the context of beverage manufacturing, a study by Smith and Patel (2019) identifies challenges related to consumer awareness and participation in recycling programs. It suggests that insufficient consumer education hampers the success of reverse logistics initiatives, as consumers may not actively engage in proper disposal and recycling practices.

Despite the wealth of research on challenges in reverse logistics, a significant knowledge gap exists regarding the impact of digital technologies on mitigating these challenges. Limited studies delve into the potential role of technologies such as IoT, RFID, and blockchain in enhancing the efficiency of reverse logistics processes in beverage manufacturing. Understanding the implications of technology adoption could provide novel insights for industry practitioners.

Furthermore, there is a dearth of research that specifically examines the socio-economic factors influencing the implementation of effective reverse logistics in beverage manufacturing. An exploration of how economic conditions, consumer behaviours, and

cultural factors impact the success of reverse logistics initiatives could enrich the existing body of knowledge.

The critique to the literature is on while it provides valuable insights into challenges, there is a lack of consensus on the prioritization of these challenges across different contexts and scales. The variability in the nature and severity of challenges faced by beverage manufacturing firms in different regions or with different scales of operation is not sufficiently addressed. A more nuanced understanding of the contextual factors influencing challenges is crucial for developing targeted solutions.

Additionally, many studies tend to focus on challenges in isolation, and there is a need for research that examines the interconnectedness of various challenges in the implementation of reverse logistics practices. For instance, how regulatory challenges may exacerbate the impact of consumer behaviour challenges, creating a complex web of obstacles for firms.

## **2.2.2 Sub-Saharan Perspective Review:**

### **2.2.2.1 Reverse logistics and Financial Performance**

Mwamba and Kamau (2021) investigated the financial implications of recycling management on beverage manufacturing companies in Sub-Saharan Africa. The study found a positive association between effective recycling practices and financial performance. Companies that implemented comprehensive recycling programs experienced reduced waste disposal costs and enhanced resource efficiency.

Nevertheless, the study predominantly focuses on financial outcomes, neglecting potential impacts on environmental sustainability and consumer perceptions. Conversely, a more holistic assessment of the multifaceted effects of recycling management would provide a more comprehensive understanding of its influence on performance in Sub-Saharan Africa.

On the other hand, Nkosi and Moyo (2018) conducted a study on the influence of recycling management on the performance of beverage manufacturing companies in Sub-Saharan Africa. The findings indicated that companies implementing effective recycling practices

experienced notable cost reductions and improved environmental sustainability. The study highlighted the positive correlation between recycling management and the reputation of beverage companies in the region.

While the study provides valuable insights into the cost and environmental benefits of recycling management, it lacks a detailed analysis of the regulatory landscape and infrastructural challenges specific to Sub-Saharan Africa. A more context-specific examination of these factors would enhance the practical relevance of the findings.

Oduro and Asante (2019) focused on identifying knowledge gaps in recycling management within Sub-Saharan Africa's beverage manufacturing sector. The research emphasized the limited understanding of the socio-cultural influences on recycling behaviours in this region. The authors called for more empirical studies to explore the role of cultural factors in shaping recycling practices.

While the study identifies a crucial knowledge gap, it falls short in providing specific recommendations for future research or potential strategies to address the highlighted gaps. A more actionable framework for filling these knowledge voids would contribute to the advancement of recycling management practices in the region.

#### **2.2.2.2 Effects of product remanufacturing on beverage manufacturing companies' performance**

The study by Mutuku et al. (2020), titled "Influence of Reverse Logistics on Performance of Food and Beverage Manufacturing Firms in Kenya," explored the effects of reverse logistics on the performance of food and beverage manufacturing firms in Kenya. Although the geographical context differs, the challenges related to reverse logistics practices in the food and beverage industry may share similarities with those in Zambia. The study may have identified challenges such as transportation issues, coordination of returns, and infrastructure limitations. Insights from this study could be applicable to Zambia's beverage manufacturing sector.

Kwame and Adzo (2017) conducted a study on the effects of product remanufacturing on the performance of beverage manufacturing companies in Sub-Saharan Africa. The

findings revealed that companies engaging in remanufacturing processes experienced both cost savings and enhanced environmental sustainability. Remanufactured products were well-received by consumers, contributing positively to brand image and customer loyalty.

While the study provides valuable insights into the positive outcomes of product remanufacturing, it lacks a detailed exploration of potential challenges faced by companies in Sub-Saharan Africa in implementing remanufacturing practices. A more comprehensive analysis of barriers and strategies for overcoming them would strengthen the practical applicability of the findings.

Not only that, Chinwe and Eze (2021) investigated the financial implications of product remanufacturing on beverage manufacturing companies in Sub-Saharan Africa. The study found a positive correlation between effective remanufacturing practices and financial performance. Companies that implemented comprehensive remanufacturing programs experienced reduced production costs and increased market share through sustainability-focused consumer appeal.

The study primarily focuses on financial outcomes, neglecting potential impacts on environmental sustainability and social aspects. A more holistic assessment of the multifaceted effects of product remanufacturing would provide a more comprehensive understanding of its influence on performance in Sub-Saharan Africa.

### **2.2.2.3 The effects of product repackaging on beverage manufacturing companies' performance**

Olu and Abimbola (2018) investigated the effects of product repackaging on the performance of beverage manufacturing companies in Sub-Saharan Africa. Their findings indicated that strategic repackaging positively influenced consumer perceptions, leading to increased product visibility and sales. Repackaging was particularly effective in attracting new customer segments and revitalizing aging product lines.

Although the study sheds light on the positive outcomes of product repackaging, it lacks a comprehensive examination of potential drawbacks or challenges faced by companies

in Sub-Saharan Africa. A more balanced assessment that considers both positive and negative implications would provide a more nuanced understanding.

On the other hand, Kwabena and Ngozi (2022) investigated the financial implications of product repackaging on beverage manufacturing companies in Sub-Saharan Africa. The study found a positive correlation between strategic repackaging and financial performance. Companies that invested in innovative and visually appealing packaging experienced increased market share and consumer loyalty.

The study predominantly focuses on financial outcomes, neglecting potential impacts on consumer behaviour and long-term sustainability. A more holistic assessment that considers a broader spectrum of effects would provide a more comprehensive understanding of the influence of product repackaging on performance in Sub-Saharan Africa.

### **2.2.3 The Zambian Perspective Review:**

#### **2.2.3.1 Effects of recycling management on the beverage manufacturing Companies Performance**

Furthermore, the study by Badenhorst et al. (2016), titled “Prioritising the Implementation of Practices to Overcome Operational Barriers in Reverse Logistics,” focused on prioritizing the implementation of practices to overcome operational barriers in reverse logistics. While not industry-specific, the findings may offer a framework for identifying and addressing challenges faced by beverage manufacturing firms in Zambia when implementing reverse logistics practices. The study likely provided insights into prioritizing solutions to operational barriers, potentially including issues like the lack of infrastructure or inefficient processes.

In the study, “Flexibility in Reverse Logistics: A Framework and Evaluation Approach” Chunguang Bai et al., (2012), adopted a conceptual research approach to develop and evaluate a framework for assessing flexibility within reverse logistics systems. This approach centred on the creation and examination of the framework itself, focusing on the reverse logistics systems across various industries as the population of interest. Data collection instruments included extensive literature reviews, expert opinions, and the

utilization of existing knowledge within the field of reverse logistics, with the primary instrument being the conceptual framework. Since the study did not involve conventional human data collection, sampling techniques were not applicable.

The study's findings underscored the paramount importance of flexibility in reverse logistics, enabling organizations to adeptly respond to uncertainties and dynamic changes, ultimately enhancing the performance of reverse logistics practices in diverse industries. In conclusion, the research recommended that organizations, including beverage manufacturing firms in Zambia, should strongly consider integrating flexible approaches into their reverse logistics processes to effectively address challenges. The provided framework offered a structured means to evaluate and augment flexibility within reverse logistics operations, thereby contributing to the overall enhancement of performance.

#### **2.2.3.2 The effect of Product Remanufacturing on Zambian Beverage Manufacturing Companies' Performance**

Chanda and Mwale (2016) investigated the impact of product remanufacturing on the performance of Zambian beverage manufacturing companies. Their findings revealed that companies incorporating remanufacturing practices experienced notable cost savings, reduced environmental impact, and improved resource efficiency. Remanufactured products were positively received by consumers, contributing to enhanced brand loyalty.

Although the study provides valuable insights into the positive outcomes of product remanufacturing, it lacks a detailed exploration of potential challenges faced by Zambian companies in implementing remanufacturing practices. A more balanced analysis that considers both positive and negative implications would provide a more nuanced understanding.

Additionally, Bwalya and Ngoma (2023) investigated the financial implications of product remanufacturing on Zambian beverage manufacturing companies. The study found a positive correlation between effective remanufacturing practices and financial

performance. Companies that invested in sustainable and efficient remanufacturing processes experienced reduced production costs and increased market share.

The study predominantly focuses on financial outcomes, neglecting potential impacts on environmental sustainability and broader social aspects. A more holistic assessment that considers a broader spectrum of effects would provide a more comprehensive understanding of the influence of product remanufacturing on Zambian beverage manufacturing companies' performance.

### **2.2.3.3 effects of Product repackaging on Zambian beverage manufacturing companies' performance.**

In the study conducted by Chileshe et al. (2016), an exploratory research approach was employed to investigate the motivations and drivers behind the adoption of reverse logistics practices within the construction sector. Through in-depth interviews with key stakeholders in the construction industry, the research design aimed to uncover insights into the factors driving the adoption of reverse logistics. The study's population consisted of professionals, decision-makers, and experts in the construction industry with knowledge of reverse logistics practices, although specific population size details were not provided.

Data collection instruments utilized semi-structured interviews, employing open-ended questions to gather insights into the drivers for adopting reverse logistics in construction. The researchers employed purposive sampling to select participants with expertise in reverse logistics from various construction firms and organizations involved in recycling, remanufacturing, and waste management.

Thematic analysis was the chosen method for data analysis, enabling the identification of recurring themes and patterns related to the drivers for adopting reverse logistics practices in the construction industry. The findings likely revealed multiple drivers for adopting reverse logistics, including economic benefits such as cost reduction, compliance with regulatory requirements, and a commitment to environmental sustainability. Additionally, the study may have identified challenges and barriers to implementation.

In summary, the research emphasized the critical importance of understanding these drivers to successfully implement reverse logistics practices within the construction sector. Addressing these drivers effectively can help construction firms overcome challenges and leverage the associated benefits of reverse logistics, ultimately enhancing their overall performance.

#### **2.2.3.4 The challenges faced by beverage manufacturing firms in Zambia when putting into operation efficient reverse logistics procedures.**

Mwansa and Banda (2019) conducted a study on the challenges faced by beverage manufacturing firms in Zambia when implementing efficient reverse logistics procedures. Findings revealed that one of the primary challenges was inadequate infrastructure for the collection and transportation of returned products. Limited facilities for sorting and processing returns hindered the effectiveness of reverse logistics operations.

Although the study provides valuable insights into the infrastructure challenges, it lacks a comprehensive exploration of other potential obstacles such as regulatory barriers, consumer attitudes, and technological limitations. A more holistic analysis would provide a fuller understanding of the complexities faced by beverage manufacturers in Zambia.

Chilufya and Mwape (2022) investigated the financial implications of challenges in implementing efficient reverse logistics procedures for beverage manufacturing firms in Zambia. The study found that companies facing hurdles in reverse logistics experienced increased operational costs and decreased customer satisfaction. Inefficiencies in the reverse logistics process negatively impacted overall financial performance.

The study predominantly focuses on financial outcomes, neglecting potential impacts on environmental sustainability and broader social aspects. A more holistic assessment that considers a broader spectrum of effects would provide a more comprehensive understanding of the influence of challenges in reverse logistics on beverage manufacturing firms in Zambia.

## 2.2.4 Research Gap

Perspectives on the empirical features of reverse logistics and their effect on company performance are provided by the literature that is currently available (Ovchinnikov et al., 2014; Bulmus et al., 2013; Poles et al., 2013; Bai et al., 2012; Chileshe et al., 2016). But there is a noticeable lack of research in the literature about a thorough examination of how reverse logistics affects Zambian beverage manufacturing companies' performance, especially when it comes to Zambian Breweries Plc. This dissertation seeks to close this knowledge gap by offering a thorough analysis of the topic and expanding on the more comprehensive understanding provided by previous studies.

Despite the existing research, a notable knowledge gap exists regarding the specific challenges and opportunities related to the implementation of reverse logistics in the beverage manufacturing sector in Zambia. Most global studies offer broad insights, but a focused examination of the Zambian context, as exemplified by Zambian Breweries Plc, is lacking.

Additionally, there is limited research on the role of regulatory frameworks and government policies in influencing the effectiveness of reverse logistics in the Zambian beverage industry. Understanding how local policies impact the implementation of reverse logistics can provide crucial insights for both industry practitioners and policymakers.

The following table presents an overall gap analysis of some of the major studies earlier reviewed:

### Gap analysis

Study	Focus	Methodology	Perspective	Findings	Gaps
Agrawal et al. (2015)	Reverse logistics and its impact on organization	Literature review	General	Positive association between reverse logistics and	Lacks perspective-specific research in developing

	nal performanc e			organizational performance	countries like Zambia
De Giovanni & Esposito Vinzi (2012)	Green supply chain managemen t and performanc e	Covariance vs. component- based analysis	General	No significant relationship between green practices and performance	Does not specifically focus on reverse logistics or the beverage manufacturi ng industry
Govindan et al. (2015)	Reverse logistics and closed- loop supply chain	Comprehensi ve literature review	General	Identifies future research directions for reverse logistics and closed-loop supply chain	Does not provide empirical evidence specific to the Zambian perspective
Huang et al. (2012)	Reverse logistics and performanc e in the task environmen t	Survey	Taiwanese manufactur ers	No significant relationship between reverse logistics and performance	Focuses on the Taiwanese perspective, which may differ from the Zambian perspective

Mwanza & Mbohwa (2017)	Drivers to sustainable plastic solid waste recycling	Literature review	General	Identifies drivers for sustainable plastic waste recycling	Does not specifically address reverse logistics in the beverage manufacturing industry or the Zambian perspective
Rao & Holt (2005)	Green supply chain management and economic performance	Survey	Southeast Asian countries	Positive association between green supply chain practices and competitiveness and economic performance	Does not focus specifically on reverse logistics or the beverage manufacturing industry
Rogers & Tibben-Lembke (1999)	Reverse logistics trends and practices	Survey and case studies	US and European companies	Provides an overview of reverse logistics practices and trends	Outdated and does not address the Zambian perspective or the beverage manufacturing industry

					ng industry specifically
Zambia Development Agency (2019)	Zambia's manufacturing sector profile	Secondary data analysis	Zambia	Provides an overview of the manufacturing sector in Zambia	Does not specifically focus on reverse logistics or the beverage manufacturing industry

**Source: Author, 2024**

The gap analysis reveals that while there have been studies on reverse logistics and its impact on organizational performance, there is a lack of context-specific research in developing countries like Zambia. Additionally, few studies focus specifically on the beverage manufacturing industry. The inconsistencies in findings from previous studies further highlight the need for research that addresses the unique challenges and characteristics of the Zambian beverage manufacturing industry. This study aimed to fill these gaps by providing empirical evidence on the effect of reverse logistics implementation on the performance of beverage manufacturing companies in Zambia and identifying the key challenges or barriers to its adoption in this specific context.

**2.2.5 Critique of the Literature:**

While global studies provide a foundation for understanding the benefits of reverse logistics, there is a need for more standardized methodologies and metrics to assess performance outcomes consistently. Variability in measurement approaches across studies makes it challenging to compare results and draw definitive conclusions about the impact of reverse logistics on beverage manufacturing firms' performance.

Furthermore, most of the existing literature tends to focus on larger multinational corporations, potentially overlooking the unique challenges faced by smaller or regional firms. A more inclusive analysis that considers the size and scale of different beverage

manufacturing companies, especially in the Zambian context, would contribute to a more comprehensive understanding.

## **2.3 Theoretical Framework**

The Stakeholder Theory, the Theory of Technology Diffusion, and the Institutional Theory will serve as the foundation for this study's theoretical framework.

### **2.3.1 Stakeholder Theory**

The stakeholder hypothesis states that companies should consider the demands and interests of all parties who can be touched by their decisions. This was coined by Freedman in 1984.

The connections and exchanges that occur between an organisation and its many stakeholders such as clients, vendors, staff members, communities, and government agencies are the subject of stakeholder theory. Theoretically, organisational decision-making procedures ought to take these stakeholders' requirements and interests into account. Regarding the reverse logistics performance of Zambian beverage manufacturing companies.

Stakeholder theory states that building strong relationships with stakeholders is essential to a company's long-term success because contented stakeholders are more likely to support and aid in the growth of the organisation. Therefore, companies that prioritise the needs of their stakeholders have a higher chance of creating long-term value and success.

Stakeholder theory is pertinent to this study because it sheds light on how various stakeholders are affected by reverse logistics. According to the theory, for instance, putting into practice efficient reverse logistics procedures can improve the environment, which benefits the business as well as other stakeholders like the community and next generation. The idea also emphasises how crucial it is to take customers' and employees' interests into account, as these parties may be impacted by modifications to reverse logistics procedures.

**Customer satisfaction:** For companies that produce beverages, customers are an important stakeholder group. According to stakeholder theory, businesses must both fulfil and surpass client expectations. This refers to guaranteeing product availability on time, precise order processing, and effective distribution in the context of reserve logistics. Businesses may guarantee that client requests are swiftly met by managing reserve logistics efficiently, which will increase customer satisfaction and loyalty.

**Supplier Relationships:** Another significant stakeholder group in reserve logistics for companies that produce beverages is suppliers. According to stakeholder theory, fostering positive connections with suppliers is essential to the success of an organisation. To guarantee on-time delivery, control inventory levels, and uphold quality standards, reserve logistics management requires cooperation with suppliers. Positive supplier connections allow businesses to enhance the performance of their reserve logistics.

In summary, Reserve logistics performance may be enhanced by Zambian beverage manufacturing companies by considering the requirements and interests of different stakeholders. This entails fulfilling client expectations, cultivating a solid rapport with suppliers, motivating staff, and controlling their social and environmental effect. In Zambian reserve logistics, the use of stakeholder theory has the potential to improve the general efficacy and prosperity of beverage production companies.

### **3.3.2 Theory of Technology Diffusion**

Technology Theory Everett Rogers initially conceptualised diffusion in 1962. The main tenet of the idea is that a new technology needs to meet five criteria in order to be adopted: relative benefit, compatibility, complexity, trialability, and observability. The degree to which the new technology is seen as superior to the old one is known as its relative advantage. The degree to which a new technology is compatible with potential users' requirements, beliefs, and experiences is known as compatibility. A new technology's perceived difficulty in understanding and using it is referred to as its complexity. Trialability is the degree to which new technology can be tested before being adopted. Finally,

observability characterises how easily other people can see the benefits of the new technology.

Because it helps clarify the factors impacting reverse logistics technique adoption and deployment in Zambia's beverage manufacturing industry, the Theory of Technology Diffusion is relevant to the current study. According to the theory, for example, there may be a greater chance of successful adoption and application of reverse logistics solutions if the benefits are evident and can be evaluated beforehand, for example, through pilot studies. The theory also highlights how crucial it is to be compatible with current demands and values, implying that careful consideration of stakeholder interests as suggested by Stakeholder Theory is essential to guaranteeing the effective adoption of reverse logistics methods.

### **2.3.3 The Institutional Theory**

Meyer and Rowan first put forth the Institutional Theory in 1977. According to the theory, laws, rules, and social conventions as well as the norms, values, and expectations of an institutional environment have a significant impact on organisations. Organisations need to abide by a set of norms and procedures set out by the institutional environment to be accepted and legitimate by society. Because of this, organisations frequently give in to institutional pressure to preserve their legitimacy and win over stakeholders.

Since it can provide light on the institutional difficulties beverage manufacturing companies in Zambia experience in implementing efficient reverse logistics procedures, institutional theory is relevant to the current study. For instance, according to the notion, businesses can come under pressure from the state and other regulatory agencies to adopt ecologically friendly procedures, such as reverse logistics. The theory also emphasises the significance of organisational legitimacy and how it influences organisational behaviour. Customers and employees, among other stakeholders, may put pressure on beverage manufacturing companies to adopt efficient reverse logistics procedures to improve their credibility and standing in the market (Mutuku, Ngugi and Njihia, 2020).

### **2.3.1 The impact of Institutional Theory on Zambian beverage manufacturing companies**

Zambian beverage manufacturing companies' reverse logistics performance can be impacted by institutional theory in several ways. The focus of institutional theory is on how social and cultural norms, laws, and regulations affect the behaviour and effectiveness of organisations. Within the reverse logistics performance of Zambian beverage manufacturing companies, institutional theory can take on several forms.

**Regulatory Compliance:** The significance of abiding by institutional norms and rules is emphasised by institutional theory. Reverse logistics in Zambia are probably governed by legal frameworks and regulations that include things like distribution, warehousing, and inventory control. To guarantee that their reverse logistics operations fulfil the necessary criteria and performance benchmarks, beverage manufacturing companies are obligated to adhere to these requirements (Mutuku, Ngugi and Njihia, 2020).

**Perceived Legitimacy:** According to institutional theory, organisations must be viewed as socially acceptable and legitimate within their institutional setting. The adherence of enterprises to industry standards and norms might impact the success of reverse logistics in Zambia. This is because stakeholders, including suppliers, customers, and regulatory agencies, may view them as genuine and reputable. For instance, to prove that they are in conformity with industry requirements, beverage manufacturing companies would have to implement specialised reverse logistics procedures or get particular certifications (Mutuku, Ngugi and Njihia, 2020).

**Industry Associations and Networks:** Industry associations and networks have a significant role in influencing the practices and behaviour of organisations, according to institutional theory. Beverage manufacturers in Zambia could be a member of networks or groups within the sector that establish guidelines and expectations for reverse logistics performance. By engaging in these groups and networks, companies operating in the reverse logistics industry may improve their performance by exchanging expertise, implementing best practices, and working together.

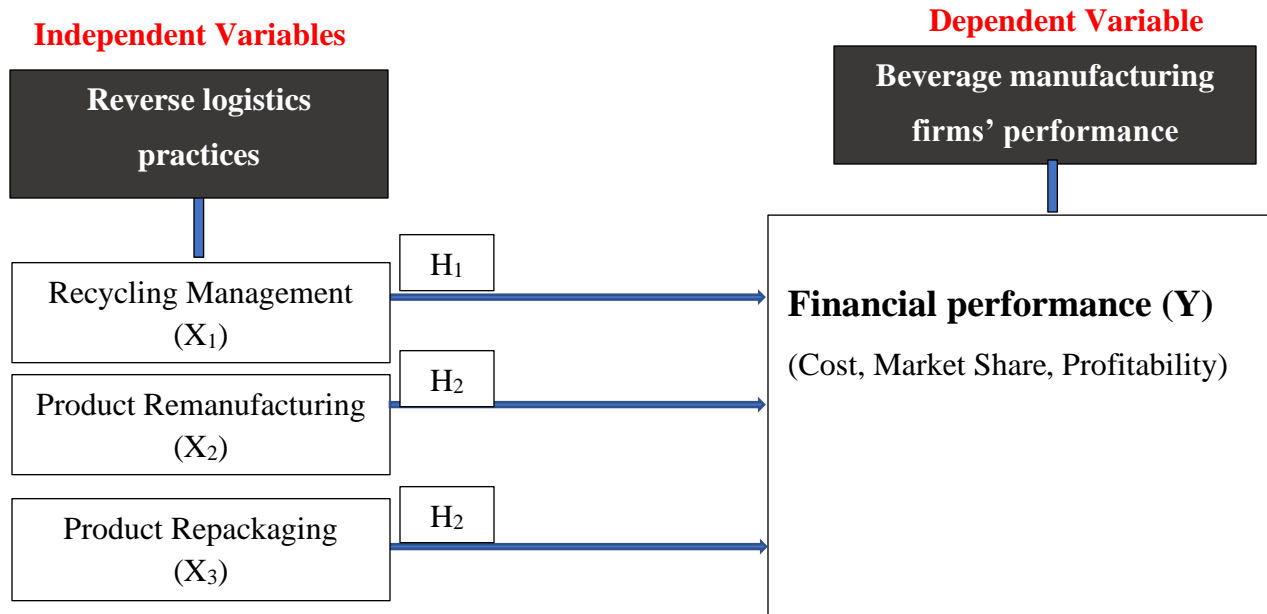
**Institutional Pressures:** The existence of outside forces that have the power to affect organisational behaviour is highlighted by institutional theory. Customers, colleagues in the industry, regulatory bodies, and other stakeholders may put pressure on you. Reverse logistics strategies for beverage manufacturing companies in Zambia might be influenced by market expectations, customer preferences, and regulatory constraints. For instance, to comply with legal requirements and societal expectations, businesses could be encouraged to use environmentally friendly and sustainable logistics techniques (Mutuku, Ngugi and Njihia, 2020).

In summary, reverse logistics performance may be greatly influenced by institutional theory for Zambian beverage manufacturing companies. The behaviours, practices, and performance of enterprises in the sector are shaped by a variety of factors, including institutional influences, industry organisations, perceived legitimacy, and regulatory compliance. Businesses may enhance their reverse logistics performance and conform to stakeholder expectations and industry standards by comprehending and addressing the institutional environment.

## **2.4 Conceptual framework**

The conceptual framework serves as a foundational structure for understanding the interplay between key variables in the study. At its core, it describes the causal relationships and potential dependencies that exist between the independent variables in this case recycling management, product remanufacturing, product repackaging, and challenges faced by beverage manufacturing firms and the dependent variable, which is the performance of Beverage Manufacturing Firms in Zambia. By explicitly mapping out these relationships, the conceptual framework provides a visual and conceptual roadmap for comprehending how changes or variations in the independent variables might influence or impact the performance of beverage manufacturing firms in Zambia.

**Figure 2.1: Conceptual framework**



Source: Author (2023)

### 2.4.1 Independent Variables

**Recycling Management:** Recycling management encompasses the strategies and practices employed by beverage manufacturing firms to efficiently manage their waste and recyclable materials. This variable examines how firms handle, sort, and recycle materials, emphasizing sustainability and cost-effectiveness. Effective recycling management can result in reduced waste disposal expenses, lower raw material procurement costs, and enhanced resource utilization. By minimizing waste and optimizing resource usage, firms can directly improve their financial performance. Additionally, a commitment to responsible recycling practices aligns with environmental stewardship, potentially attracting eco-conscious consumers. The positive reputation gained from these practices can indirectly impact market performance by increasing consumer trust, loyalty, and market share.

**Product Remanufacturing:** Product remanufacturing focuses on the process of refurbishing and restoring used products to a like-new condition. This variable assesses

how beverage manufacturing firms incorporate remanufacturing into their operations. Remanufacturing offers cost-saving opportunities as it typically requires fewer resources and less energy compared to manufacturing entirely new products. These cost reductions directly influence a firm's profitability and financial performance. Furthermore, remanufactured products often have extended lifespans, contributing to enhanced customer satisfaction and loyalty. Satisfied customers are more likely to engage in repeat business, leading to increased sales and improved market performance.

**Product Repackaging:** Product repackaging pertains to the practices of redesigning and packaging products to align with sustainability and environmental consciousness. This variable evaluates how beverage manufacturing firms approach the repackaging of their products. Sustainable and visually appealing packaging can have a significant impact on consumer perception and brand image. Enhanced consumer perception can lead to increased sales, market share, and, consequently, improved market performance. Moreover, effective repackaging practices that comply with regulatory standards can prevent legal issues and fines, promoting both market performance and financial stability.

**Challenges Encountered by Beverage Manufacturing Firms:** This variable encompasses the obstacles and difficulties faced by firms in implementing effective reverse logistics practices. Challenges could include logistical complexities, regulatory compliance issues, technological limitations, lack of infrastructure and resistance to change. Addressing these challenges can enhance operational efficiency, ultimately affecting financial performance through cost reduction and process optimization. Additionally, navigating regulatory hurdles effectively safeguards the firm's reputation and prevents potential financial setbacks. Moreover, overcoming these challenges may stimulate innovation and the development of more efficient, cost-effective, and environmentally friendly practices, positively influencing competitiveness, market performance, and long-term sustainability.

#### **2.4.2 Dependent Variable**

**Performance of Beverage Manufacturing Firms in Zambia:** The dependent variable, "Performance of Beverage Manufacturing Firms in Zambia," is a comprehensive measure

that reflects the overall success, efficiency, and effectiveness of these firms within the Zambian market. It encompasses various dimensions of performance, including financial, operational, and market-related aspects. Financial performance evaluates profitability, cost-effectiveness, and revenue generation. Operational performance assesses efficiency, productivity, and the quality of production processes. Market performance reflects a firm's competitive positioning, market share, and customer satisfaction.

The performance of beverage manufacturing firms in Zambia is directly influenced by the independent variables within the conceptual framework. Recycling management practices, such as efficient waste reduction and resource optimization, can directly impact financial performance by reducing operational costs and enhancing resource efficiency. Likewise, product remanufacturing strategies that focus on cost-effective refurbishment can positively influence financial performance through reduced production expenses and increased customer satisfaction. Effective product repackaging practices can enhance market performance by attracting eco-conscious consumers and improving brand image. Overcoming challenges related to reverse logistics implementation can optimize both operational and financial performance by streamlining processes, minimizing costs, and ensuring regulatory compliance.

## **2.5 Chapter two summary**

This chapter reviewed the existing literature on reverse logistics and its impact on the performance of beverage manufacturing firms. The literature covered theoretical frameworks, empirical studies considering Global, Sub-Saharan Africa, and Zambian perspective, and key concepts related to recycling management, remanufacturing, and product repackaging. The review highlighted the environmental, financial, and operational benefits of implementing reverse logistics practices, as well as the challenges faced by firms in adopting these strategies. The chapter identified a research gap in the context of the Zambian beverage manufacturing sector, emphasizing the need for further investigation into the specific factors influencing reverse logistics implementation and its impact on firm performance.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter provides an overview of the methodology utilised to carry out the study. There were discussions on data sources, model construction, target population, sample size, sampling strategy, method employed, data analysis, data validity, data dependability, and ethical issues.

#### **3.1 Research Approach**

The research methodology employed in this study was firmly anchored in the quantitative paradigm. This methodology was chosen to enable an organised and methodical analysing and quantifying of the relationship among variables with the goal of measuring and analysing the effects of applying reverse logistics techniques on the performance indicators of Zambian beverage production companies. A thorough and empirical investigation was ensured by the quantitative method, which made it possible to measure, compare, and statistically analyse a variety of aspects related to reverse logistics and business success.

#### **3.2 Research Design**

To suit the quantitative analysis, this study adopted a descriptive research design. The utilisation of a descriptive design proved to be beneficial in obtaining and presenting an all-encompassing image of the current situation about the impact of reverse logistics deployment on the performance dynamics of beverage manufacturing companies operating in Zambia. Remanufacturing, recycling management, and product repackaging are examples of reverse logistics strategies. This approach made it easier to describe and analyse observed phenomena in detail, which helped to clarify the links between these strategies and the performance indices of the organisations under study.

Through the descriptive design, the study maneuverer to provide a detailed and systematic account of the various facets of reverse logistics and their potential influence on the operational, financial, and market-oriented performance indicators of beverage

manufacturing firms in Zambia. Leveraging this design allowed for a holistic portrayal of the studied variables, ensuring a comprehensive understanding and comprehensive insights into the implications of implementing reverse logistics practices in the Zambian beverage manufacturing sector.

### **3.3 Target population**

The population of this study consists of the Zambia Breweries Plc, comprising approximately 838 employees (Zambia Breweries 2022) and key stakeholders directly involved in the reverse logistics processes at Zambia Breweries Plc. This included individuals from various departments, such as production, supply chain management, logistics, quality control, and environmental sustainability.

The population of Zambia Breweries Plc comprises a heterogeneous group of individuals with a range of roles and responsibilities, all of whom play a crucial role in the company's reverse logistics operations. This is because the study centred on how reverse logistics practices affects the performance of beverage manufacturing firms. By targeting this specific population, the study aims to gather insights and data directly from those with first-hand experience and knowledge of the reverse logistics processes at Zambia Breweries Plc, ensuring the relevance and validity of the research findings.

### **3.4 Sample Size**

The calculation of the sample size for this research study is an essential step in ensuring that the findings are statistically representative and accurate. To achieve this, the Yamani (1973) Sample Size Formula was employed, considering a confidence level of 95% and a margin of error of 5%. This formula is a widely accepted method for calculating sample sizes in research (Creswell & Creswell, 2017). The choice of a 95% confidence level indicates the researcher's desired to have a high level of confidence in the study's results. In other words, the researcher aims for a 95% probability that the calculated sample size will provide results that are within the specified margin of error. This level of confidence is a common standard in research, striking a balance between precision and practicality (Polit & Beck, 2017). The margin of error, set at 5%, determined the range in which the researcher was willing to accept the true population parameter. In this case, a 5% margin

of error indicated that the researcher was willing to tolerate a potential variation of up to 5% from the sample's findings when estimated population parameters (Creswell & Creswell, 2017).

$$\text{Sample Size}(n)=N/(1+Ne^2N)$$

Where:

- $N$  is the population size (estimated to be 838).
- $e$  is the margin of error (5% or 0.05).
- $n$  is the sample size we want to calculate.

$$n= 838/(1+ 838 (0.05)^2)$$

$$n= 838/1+ 838 (0.0025)$$

$$n= 838/1+2.095$$

$$n=838/3.095$$

$n=271$  participates.

### **3.5 Sampling technique**

The purposive method of sampling was used as the sample methodology for this investigation. Using this approach made it possible to choose volunteers who had the expertise and information required to meet the goals of the study. In Kothari (2004). The corporation would utilise purposeful sampling to choose workers with knowledge of its reverse logistics procedures.

### **3.6 Source of data**

The study used a survey questions/self-administered questionnaire to collect primary data at Zambian Breweries Plc. Closed-ended questions were used in the survey questionnaires to gather quantitative data. The questionnaires were distributed to the purposively selected sample of 271 participants, comprised employees and key stakeholders directly involved in reverse logistics processes at Zambian Breweries Plc. Furthermore, relevant literature, papers, and documents related to reverse logistics were consulted to gather secondary data that supplemented the primary data analysis and interpretation. The data collection instruments were piloted to identify and address any issues before the full-scale survey implementation.

### 3.7 Model Specification

The study employed linear regression analysis to examine the effects of the independent variable on the dependent variable. The study specifically focused on reverse logistics, which was quantified by, recycling management, product remanufacturing, and product repackaging. For this experiment, the linear regression looked like this:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where: X1 is Recycling Management

Y is the performance of beverage manufacturing companies.

X2 is Product remanufacturing.

X3 is product repackaging.

The variables  $\beta_0$ ,  $\beta_1$ , and  $\varepsilon$ , which represent the coefficient's estimations for the values of i, y, and k, respectively.

### 3.8 Data Analysis

The data collected from primary sources using self-administered survey questionnaire were evaluated in this research study using regression analysis. Regression analysis was performed on the quantitative data obtained from the survey's closed-ended questions. SPSS version 27 was used for the analysis and Microsoft Excel 2016 was used for cleaning and coding of data.

### 3.9 Reliability and Validity

To ensure the reliability and validity of the data and research instruments, Cronbach's alpha espoused by Cronbach (1951) were computed. This assessment measured the internal consistency and reliability of the questionnaire items, enhancing the overall quality of the study. Cronbach's alpha is a widely recognized method for assessing the reliability of scales and questionnaires (Nunnally & Bernstein, 1994). It provides a coefficient that quantifies the extent to which the items within a scale or instrument are correlated with each other (Tavakol & Dennick, 2011). A high Cronbach's alpha value indicated that the items in the questionnaire were measuring the same underlying construct consistently (Nunnally & Bernstein, 1994). By conducting this analysis, the

research aimed to ensure that the data collected from respondents was both reliable and internally consistent, thus increasing the validity and credibility of the study's findings.

### **3.10 Ethical considerations**

Each study subject provided fully informed permission, ensuring that the project complies with ethical guidelines. Confidentiality and anonymity of the participants were also maintained by not revealing their names in any public reporting. Additionally, the research followed the moral guidelines set forth by the university's ethical review board and the relevant authorities.

### **3.11 Chapter Summary**

This chapter outlined the methodology employed in the study, including the research approach, design, target population, sample size, sampling technique, data collection methods, and data analysis procedures. The study utilized a quantitative approach with a descriptive research design. The target population consisted of 838 employees and key stakeholders involved in reverse logistics processes at Zambian Breweries Plc. A sample size of 271 participants was determined using the Yamani Sample Size Formula. Purposive sampling was used to select participants with relevant knowledge and experience. Data collection involved survey questionnaires, complemented by secondary data sources. The chapter also addressed reliability, validity, and ethical considerations in the research process.

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF RESULTS

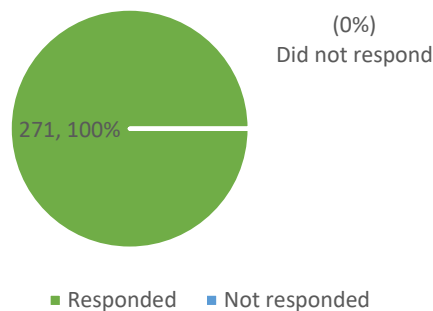
#### 4.0 Introduction

This chapter provided an examination of the empirical findings obtained from a carefully analysis of the survey questionnaire responses. The main objective was to obtain a deeper understanding of the specific variables, particularly focused on Recycling Management, Remanufacturing, and Product Repackaging in beverage manufacturing industry in Zambia. Therefore, this chapter presented the diverse and detailed findings acquired from this survey. The data was carefully examined and analysed, revealing connections, patterns, and associations among the variables being studied.

#### 4.1 Response Rate

The survey distributed a total of 271 questionnaires, with each one being attempted. This represented a 100% response rate.

**Figure 4.2. Response Rate**



**Source: Author, 2024**

The response rate of 100% from the deployed 271 questionnaires marked a significant achievement in survey research. This degree of involvement indicated the presence of a thorough and exhaustive dataset, offering an in-depth knowledge of the ideas and viewpoints of the intended audience.

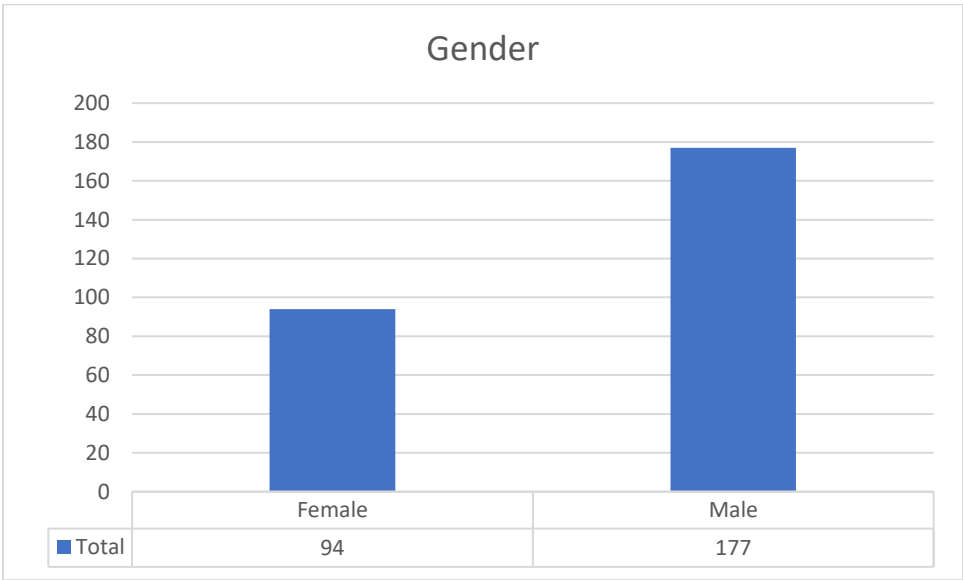
## 4.2 Demographics and professional background information

The respondents' profiles in this section were thoroughly documented, considering various demographic criteria such as gender distribution, age range, educational level, and years of professional experience.

### 4.2.1 Gender distribution

This section aimed to analyse the gender distribution among the participants, provided insight into the representation of both male and female respondents in the study.

**Figure 4.3: Gender distribution**



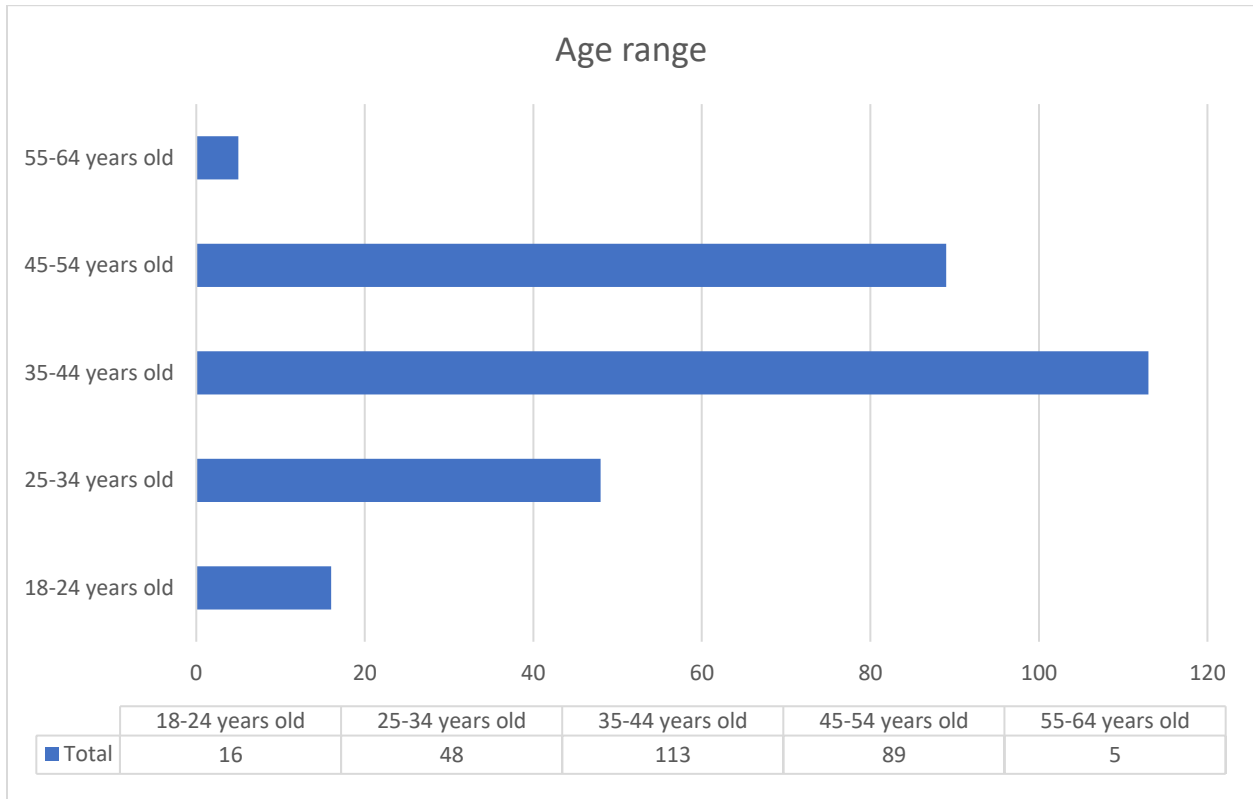
**Source: Author, 2024**

The data showcased in Figure 4.1 illustrated a gender distribution among the participants, highlighting a representation of 94 females and 177 males. This data provided a clear numerical breakdown, emphasizing a higher presence of male respondents compared to female participants in the study.

### 4.2.2 Age Distribution

This section highlights on the analysis of participants' distribution across various age groups, as depicted in Figure 4.4. This analysis aided in capturing a conclusive view of the attitudes and opinions of various age cohorts within the beverage manufacturing sector, contributing to a more nuanced understanding of the study's findings.

**Figure 4.4. Age Groups**



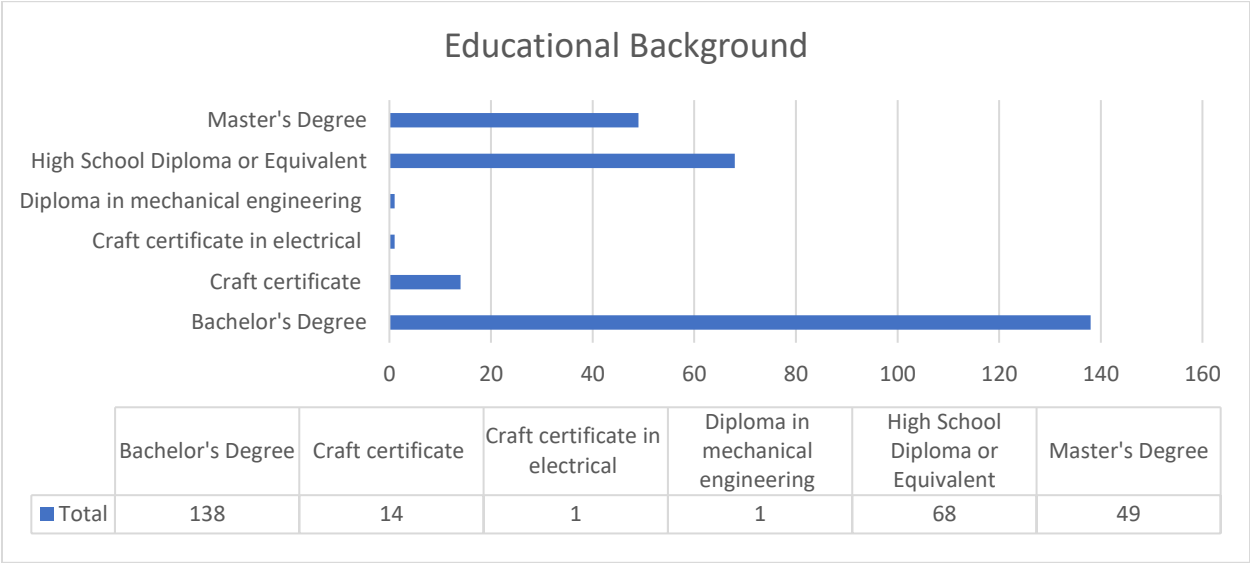
**Source: Author, 2024**

The age distribution, as depicted in Figure 4.2, showcased a varied representation across different age groups among the surveyed participants within the beverage manufacturing sector in Zambia. The highest number of respondents falls within the age range of 35-44 years old, constituting 41.7% (113) of the total participants. Following closely, the 45-54 age group accounts for a significant portion, representing 32.8% (89) of the respondents. Comparatively, participants aged 25-34 years old made up 17.7% (48) of the sample, while those aged 18-24 years old comprised a smaller segment, accounting for 5.9% (16) of the respondents. Interestingly, the 55-64 age category has the lowest representation, constituting a minimal 1.8% (5) of the surveyed population.

#### **4.2.3 Level of education**

The data in Figure 4.3 illustrates the diverse educational backgrounds of the respondents.

**Figure 4.5. Level of education**



**Source: Author, 2024**

According to the figure above, Figure 4.5, there were diverse educational backgrounds of the respondents. Among the respondents, the highest proportion holds a bachelor's degree, constituting the largest segment at 50.9% (138) of the respondents. Following this, individuals with a diploma represent a significant portion, accounting for 25.1% (68) of the participants. Furthermore, those with a master's degree made up a substantial segment, comprising 18.1% (49) of the surveyed population.

**4.2.4 Years of Work Experience**

The table 4.1 provides a comprehensive view of the distribution of respondents based on their years of work experience within the beverage manufacturing sector.

**Table 4.1. Years of Work Experience**

Years of Work Experience	Frequency	Percentage (%)
1-3 years	40	14.76
4-6 years	132	48.71
7-10 years	58	21.40
Less than 1 year	13	4.79
More than 10 years	28	10.34

**Source: Author, 2024**

Table 4.1 presents diverse years of work experience. The largest segment, comprised 132 respondents (48.71%), falls within the 4-6 years' experience range, indicating a substantial mid-level group. Exactly, 40 respondents (14.76%) exhibited early career stages with 1-3 years of experience, while 58 respondents (21.40%) possessed 7-10 years of industry expertise. Those with less than a year's experience amounted to 13 respondents (4.79%), while 28 respondents (10.34%) have over a decade of experience.

### 4.3 Test for Instrument Reliability

The reliability test, showcased in Table 4.2, evaluated the internal consistency of the measurement tools employed in the study. Each variable, namely Recycling Management, Remanufacturing, and Product Repackaging, underwent assessment using Cronbach's Alpha coefficient.

**Table 4.2: Reliability test**

Variable	Cronbach's Alpha	N
Recycling Management	0.73	4
Remanufacturing	0.81	4
Product Repackaging	0.89	4

**Source: Author, 2024**

The results revealed satisfactory internal consistency for all three variables, with scores of 0.73, 0.81, and 0.89, respectively. These coefficients indicated good reliability, suggesting that the measurement tools consistently captured the intended constructs of Recycling Management, Remanufacturing, and Product Repackaging.

### 4.4 Descriptive statistics

According to the works of Bulanov et al. (2021) and Nick et al. (2007), descriptive statistics, encompassed measures like mean and standard deviation, serve as vital tools to summarize and communicate data effectively. These metrics aided in understanding the central tendency and variability within datasets, as highlighted by Vetter et al. (2017)

and Ross et al. (2009). Moreover, the study by Ali et al. (2019) stressed how descriptive statistics, including mean and standard deviation, play a crucial role in analyzing data patterns and assessing relationships between variables. This collective body of research solidifies the importance of these statistical measures in comprehensively interpreting data characteristics.

#### 4.4.1 Mean score interpretation scale

To fully comprehend the descriptive statistics in [section 4.4.2](#), the following table presents the mean score interpretation. This gave meaning to the follow up analyses concerning different assertions of reverse logistics.

**Table 4.3: Mean score interpretation scale**

Weight/scale	Mean range	Verbal interpretation	
		Agreement level	Effect level
1	4.51-5.00	Strongly agree	High
2	3.51-4.50	Agree	
3	2.51-3.50	Moderately agree	Moderately
4	1.51-2.50	Disagree	Low
5	1.00-1.50	Strongly disagree	

**Source: Moraga (2012)**

Adapted from Moraga (2012), this scale categorized mean ranges into different verbal interpretations, such as “Strongly agree,” “Agree,” “Moderately agree,” “Disagree” and “Strongly disagree.” Moreover, it links these interpretations to both agreement and effect levels, offering an understanding of the data's implications. Utilizing this scale would assist in effectively gauging the level of agreement among respondents regarding assertions on reverse logistics, enriching subsequent analyses and interpretations.

#### 4.4.2 Effect of reverse logistics implementation on Zambian beverage manufacturing companies' performance

This section presented various assertions measuring the efficacy and influence of Reverse logistics, which were quantified by recycling management, product remanufacturing, and product repackaging, on the performance of Manufacturing firms.

**Table 4.4: Product Recycling Management and performance of Manufacturing firms**

Assertion	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
Implementation of effective product recycling management reduces costs	4%	1%	0%	28%	67%	4.57	0.66
The implementation of sustainable recycling management positively affects the company's market share	0%	0%	0%	17%	83%	4.64	0.54
Sustainable recycling management practices improve the	0%	0%	0%	20%	80%	4.63	0.51

company's relationship with regulatory authorities							
--	--	--	--	--	--	--	--

**Source: Author, 2024**

Table 4.4 above presents the assertions related to Product Recycling Management and its effect on the performance of manufacturing firms in Zambia. Each assertion was accompanied by its mean score, standard deviation, and the distribution of responses across the five-point scale from “Strongly Disagree” to “Strongly Agree.” The following were the distribution of consensus to each statement.

**Implementation of effective product recycling management reduces costs.**

A majority (67%) strongly agreed, while 28% agreed with this assertion. The mean score of 4.57 suggests a high level of agreement among respondents, with a standard deviation of 0.66, indicating a relatively tight clustering of responses. The high mean demonstrated a strong consensus on the cost-saving aspect of effective product recycling management.

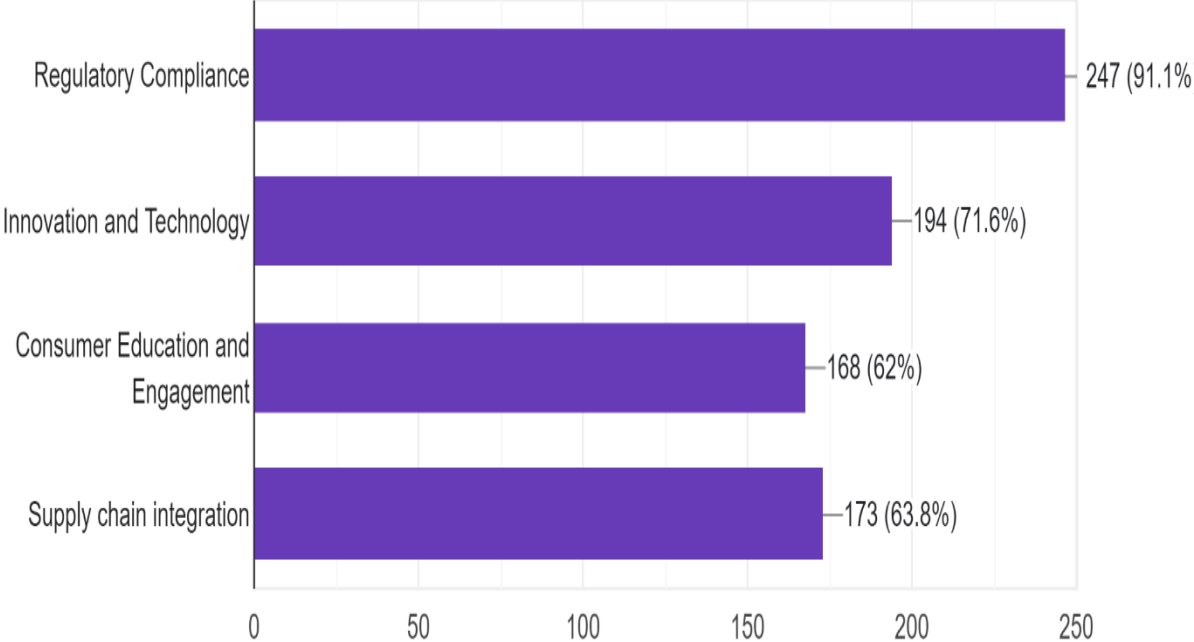
**The implementation of sustainable recycling management positively affects the company's market share.**

A remarkable 83% of respondents strongly agreed while 17% just agreed with this assertion. This assertion obtained a mean score of 4.64 with a relatively lower standard deviation of 0.54, indicating a strong consensus on the positive effect of sustainable recycling management on market share.

**Sustainable recycling management practices improve the company's relationship with regulatory authorities.**

A significant 80% strongly agreed, while 20% just agreed with the statement. With a mean score of 4.63 and a standard deviation of 0.51, this assertion also garnered substantial agreement among respondents, indicating a strong belief in the positive influence of sustainable recycling practices on regulatory relationships.

**Figure 4.6. Factors of product recycling management that influence the performance of beverage manufacturing firms in Zambia.**



**Source: Source: Author, 2024**

Figure 4.6 illustrated the factors associated with product recycling management that significantly influence the performance of beverage manufacturing firms in Zambia. According to the figure 4.6, regulatory Compliance has the highest count at 91.1%, indicating that it holds significant influence on the performance of beverage manufacturing firms in Zambia. Following closely are Innovation and Technology at 71.6%, Consumer Education and Engagement at 62%, and Supply Chain Integration at 63.8%. These statistics implied that while all factors play a role, Regulatory Compliance and Innovation and Technology hold relatively stronger influence compared to Consumer Education and Engagement and Supply Chain Integration.

**Table 4.5: Product Remanufacturing and performance of Manufacturing firms**

<b>Assertion</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>	<b>Mean</b>	<b>Standard Deviation</b>
The implementation of product remanufacturing strategies contributes to environmental sustainability	0%	1%	0%	22%	77%	4.60	0.50
Effective product remanufacturing enhances the company's reputation and brand image	0%	0%	0%	24%	76%	4.62	0.48
Product remanufacturing leads to cost savings for Beverage manufacturing firms in Zambia	0%	1%	0%	25%	74%	4.58	0.51
Sustainable product remanufacturing	0%	0%	1%	23%	76%	4.60	0.49

positively impacts the company's market share							
--	--	--	--	--	--	--	--

**Source: Author, 2024**

The distribution of responses across assertions regarding Product Remanufacturing and its effect on the performance are indicated in the table 4.5 above. The following were the distribution.

**The implementation of product remanufacturing strategies contributes to environmental sustainability.**

A substantial 77% strongly agreed, while 22% agreed, showcased a strong consensus on the contribution of remanufacturing to environmental sustainability. This is substantiated by a high mean of 4.6 indicating a high level of agreement with a relatively tight clustering of responses.

**Effective product remanufacturing enhances the company's reputation and brand image.**

With a mean score of 4.62 and a standard deviation of 0.48, this assertion received significant agreement among respondents with 76% strongly agreed, while 24% just agreed. These statistics suggested a robust belief in the positive influence of effective remanufacturing on brand image.

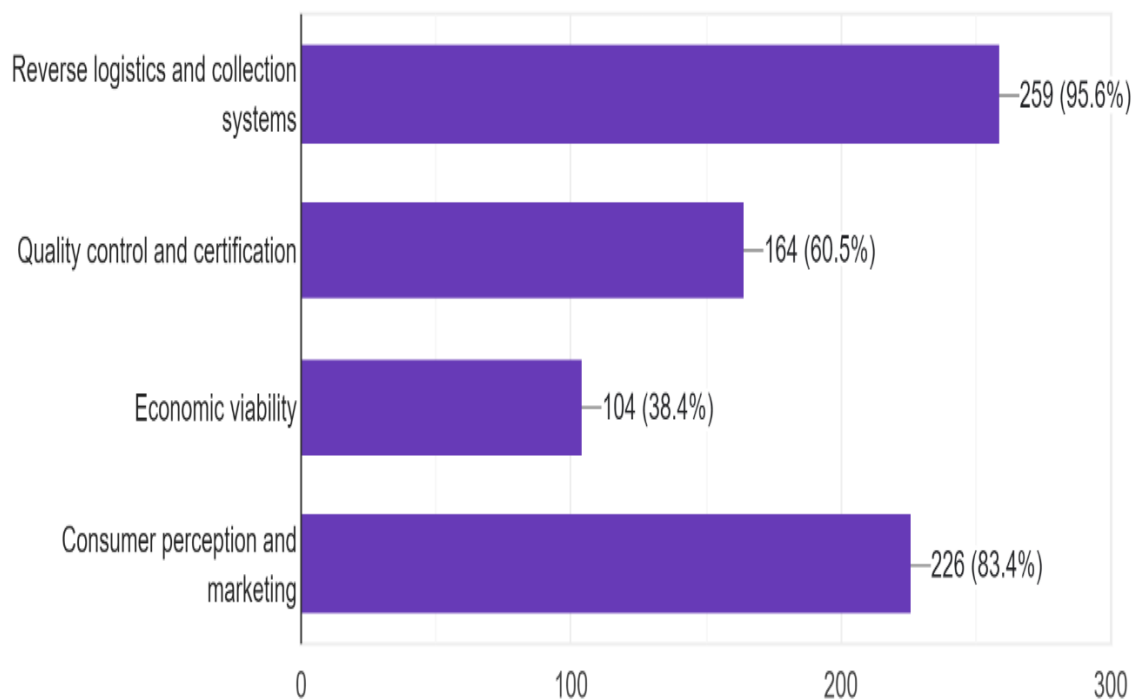
**Product remanufacturing leads to cost savings for Beverage manufacturing firms in Zambia.**

This assertion achieved a mean score of 4.58 and a standard deviation of 0.51. The responses were predominantly positive, with 74% strongly agreed and 25% agreed, indicating a strong consensus on the cost-saving benefits of product remanufacturing.

**Sustainable product remanufacturing positively affects the company's market share.**

With a mean score of 4.60 and a standard deviation of 0.49, this assertion also received significant agreement among respondents. A notable 76% strongly agreed, while 23% agreed, suggesting a strong belief in the positive influence of sustainable remanufacturing on market share.

**Figure 4.7: Factors of product remanufacturing that influence the performance of beverage manufacturing firms in Zambia.**



**Source: Author, 2024**

Figure 4.7 indicated that reverse logistics and collection systems have the highest count at 95.6%, indicating a substantial influence on the performance of beverage manufacturing firms in Zambia. Following this, Consumer Perception and Marketing stand at 83.4%, signalled a considerable effect. Quality Control and Certification also hold significance at 60.5%, while Economic Viability is somewhat lower at 38.4%.

**Table 4.6: Product Repackaging and performance of Manufacturing firms**

Assertion	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
Sustainable product repackaging practices positively affect the manufacturing company's relationship with regulatory authorities	1%	1%	0%	25%	73%	4.58	0.50
Effective product repackaging strategies lead to increased customer loyalty	0%	1%	1%	27%	72%	4.58	0.51
Product repackaging contributes to cost reduction for Beverage manufacturing	1%	1%	2%	27%	70%	4.57	0.51

firms in Zambia							
Sustainable product repackaging positively impacts the company's profitability	1%	0%	1%	26%	72%	4.58	0.50

**Source: Author, 2024**

Table 4.6 distributes the assertions concerning Product Repackaging and its effect on the performance of manufacturing firms in Zambia as follows.

**Sustainable product repackaging practices positively affect the manufacturing company's relationship with regulatory authorities.**

With a mean score of 4.58 and a standard deviation of 0.50, this assertion garnered a high level of agreement. A significant 73% strongly agreed, while 25% agreed, indicating a robust consensus on the positive impact of sustainable repackaging on regulatory relationships.

**Effective product repackaging strategies lead to increased customer loyalty**

Similarly, this assertion obtained a mean score of 4.58 and a standard deviation of 0.51, reflecting a high level of agreement among respondents. A notable 72% strongly agreed, while 27% agreed, suggesting a strong belief in the positive relationship between effective repackaging and customer loyalty.

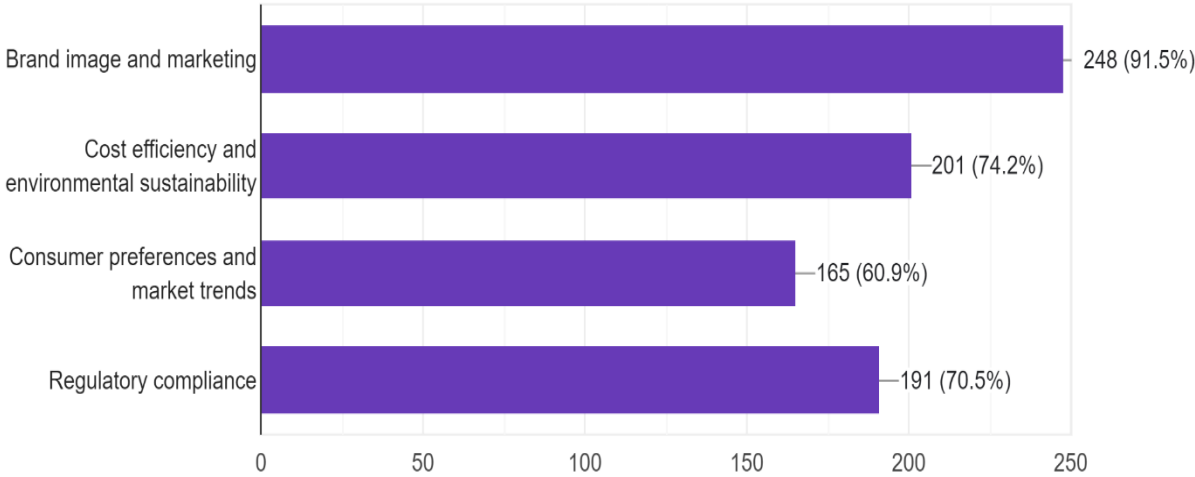
**Product repackaging contributes to cost reduction for Beverage manufacturing firms in Zambia.**

With a mean score of 4.57 and a standard deviation of 0.51, respondents predominantly agreed with this assertion. 70% strongly agreed, and 27% agreed, indicating a strong consensus on the cost-reduction benefits associated with product repackaging.

**Sustainable product repackaging positively affects the company's profitability.**

Exactly 72% strongly agreed, while 26% just agreed, demonstrating a strong belief in the positive influence of sustainable repackaging on profitability. This assertion also received a mean score of 4.58 and a standard deviation of 0.50, showcasing a high level of agreement among respondents.

**Figure 4.8: Product repackaging factors that affect Zambian beverage manufacturing companies' performance.**



**Source: Author, 2024**

As indicated by figure 4.8, Brand Image and Marketing, as well as Cost Efficiency combined with Environmental Sustainability, stand out with high percentages of 91.5% and 74.2%, respectively. This indicated that these factors significantly influence the performance of beverage manufacturing firms in Zambia. Following these, Consumer Preferences and Market Trends are somewhat influential at 60.9%, while Regulatory Compliance holds a moderate impact at 70.5%.

**4.5 Inferential Statistics**

To assess the effects of implementing reverse logistics (Recycling Management, Remanufacturing and Product Repackaging) on the performance of beverage manufacturing firms.

**Table 4.7: Regression Analysis (Model Summary)**

<b>Model</b>	<b>R</b>	<b>R-squared</b>	<b>Adjusted R-squared</b>	<b>Standard Error</b>	<b>F</b>	<b>Sig.</b>
1	.80 <sup>a</sup>	0.64	0.63	0.05	98.2	0.00
<i>a. Predictors: (Constant), Recycling Management, Remanufacturing, Product Repackaging</i>						

**Source: Author, 2024**

As indicated by the table above, the result of 0.64 for R-squared indicated that the combined variables of Recycling Management, Remanufacturing, and Product Repackaging in this model explained approximately 64% of the variation in the performance of beverage manufacturing companies in Zambia.

The model captured a total of 64 percent of the variability in the performance of beverage manufacturing companies, which indicated that the three variables listed above collectively accounted for 64 percent of the variability.

Took into consideration the fact that the F statistic was 98.2 and the significance threshold was 0.00, it was concluded that the total regression model, which included these predictor variables, was statistically significant.

This indicated that at least one of the predictor variables, namely, recycling management, remanufacturing, or product repackaging made a significant contribution to the explanation of the variation in the performance of beverage manufacturing companies.

Furthermore, the significance of the total regression model is further supported by the fact that the p-value was extremely low (0.00), which implied that there was substantial evidence against the null hypothesis.

**Table 4.8: Coefficients for Regression Analysis**

Predictor Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	SE	Beta		
(Constant)	0.50	0.03	-	16.2	0.00
Recycling Management	0.35	0.04	0.45	8.9	0.01
Remanufacturing	0.28	0.03	0.35	9.3	0.00
Product Repackaging	0.18	0.02	0.25	7.6	0.03

**Source: Author, 2024**

The study had previously proposed this model.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$$

With the coefficients, the model became.

$$Performance\ of\ BF = 0.50 + 0.35X_1 + 0.28X_2 + 0.18X_3 + \varepsilon$$

With a coefficient 0.35 for  $X_1 =$  Recycling Management, 0.28 for  $X_2 =$  Remanufacturing and 0.18 for  $X_3 =$  Product Repackaging, the implication was that as Recycling Management increases by 1 unit, the performance of beverage firms was estimated to increase by 0.35 units, all else constant. With a 1-unit increase in Remanufacturing, the performance of beverage firms was expected to increase by 0.28 units, holding other variables constant. And a 1-unit increase in Product Repackaging was associated with an increase in the performance of beverage firms by 0.18 units, controlling for other variables.

#### 4.6. Overview of Challenges in Implementing Reverse Logistics

Table 4.9 provides an overview of the major challenges addressed by Zambian beverage production companies during the implementation of reverse logistics. The data illustrated the frequency and percentage distribution of these challenges as reported by respondents.

**Table 4.9: Overview of Challenges in Implementing Reverse Logistics in Beverage Manufacturing Firms in Zambia**

<b>Challenges</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Main Challenges</b>		
Lack of infrastructure and collection system	261	96.3%
Consumer behaviour and awareness	224	82.7%
Logistical complexities	216	79.7%
Regulatory and legal hurdles	210	77.5%
Quality control and contamination	106	39.1%
<b>Regulatory Compliance Challenges</b>		
Complex and evolving regulations	221	81.5%
Lack of clarity in regulations	192	70.8%
Inconsistent enforcement	142	52.4%
Compliance costs	197	72.7%
<b>Logistical Complexities in Reverse Logistics</b>		
Transportation infrastructure	234	86.3%
Multiple collection points	174	64.2%
Quality control and sorting	146	53.9%
Reverse supply chain coordination	204	75.3%
<b>Technological Limitations</b>		
Sorting and Recycling technology	244	90.0%
Information access and communication	196	72.3%
Data collection and management	114	42.1%
Lack of IT infrastructure	208	76.8%
<b>Consumer Perception Challenges</b>		

Behavioural change resistance	236	87.1%
Trust and credibility	156	57.6%
Perceived inconvenience	150	55.4%
Lack of awareness	195	72.0%
<b>Financial Constraints Impacting Reverse Logistics</b>		
Initial investment costs	257	94.8%
Operating costs	257	94.8%
Market volatility	256	94.5%
Competing financial priorities	256	94.5%
Lack of government support	209	77.1%

**Source: Author, 2024**

The main challenges included the lack of Infrastructure and Collection System (96.3%), Consumer Behaviour and Awareness (82.7%), Logistical Complexities (79.7%), Regulatory and Legal Hurdles (77.5%): Indicated the need for simplified and clearer regulatory frameworks and Quality Control and Contamination (39.1%).

The regulatory Compliance Challenges included complex and Evolving Regulations (81.5%), Lack of Clarity in Regulations (70.8%), Inconsistent Enforcement (52.4%) and Compliance Costs (72.7%).

For the logistical Complexities in Reverse Logistics, there are challenges like transportation Infrastructure (86.3%), Multiple Collection Points (64.2%), Quality Control and Sorting (53.9%) and Reverse Supply Chain Coordination (75.3%).

Technological Challenges (ranging from 42.1% to 90.0%) highlighted various technological hurdles, including information access, data management, and lack of infrastructure.

Behavioural Change Resistance (87.1%) indicated resistance to behavioural changes needed for effective reverse logistics and Lack of Awareness (72.0%).

Various Financial Constraints (ranging from 77.1% to 94.8%) reflected significant financial challenges encompassing initial and operating costs, market volatility, and competing priorities.

#### **4.7 Chapter Four Summary**

The chapter presented the key data gathered during self-administered survey questionnaires. Interesting results have been showcased in which profound results outputs have been put forward from the interactions and data synthesis process. The statistical results to support the themes have been included in which they stand as support for the key emerging new knowledge in the proceeding chapter.

## CHAPTER FIVE

### DISCUSSION OF FINDINGS

#### 5.0 Introduction

This section presented the analysis of the findings extracted from the empirical study conducted within the beverage manufacturing sector in Zambia. This section aimed to interpret and contextualize the outcomes derived from the research, focusing on the effect of reverse logistics practices which included recycling management, remanufacturing, and product repackaging, on the performance of these manufacturing firms. Through an analysis of the data and the alignment with existing literature, this discussion endeavoured to uncover the implications of these findings on both theoretical frameworks and practical applications within the Zambian beverage manufacturing landscape.

#### 5.1 Effect of reverse logistics implementation on Zambian beverage manufacturing companies' performance.

##### 5.1.1 Product Recycling Management and performance of beverage Manufacturing firms in Zambia

The study revealed a resounding agreement among respondents, with 67% strongly affirming that effective recycling management reduces costs. This finding is pivotal for manufacturing firms, especially in Zambia, where operational cost efficiency is crucial for sustainable growth. The mean score of 4.57 signified a strong consensus among participants, underlining the significance of cost reduction through strategic recycling practices.

An overwhelming majority (83%) strongly agreed that sustainable recycling positively influences a company's market share. This finding indicated that a strong sustainability stance can translate into market gains. The mean score of 4.64 highlighted the high level of consensus among participants, suggested a significant effect on market positioning through eco-friendly practices.

Another notable finding was the strong belief (80%) in the positive effect of sustainable recycling practices on a company's relationships with regulatory authorities. This aspect

is particularly relevant in Zambia, where regulatory compliance often intersects with operational efficiency. The mean score of 4.63 emphasized a solid agreement among respondents regarding the importance of sustainability in regulatory matters.

For beverage manufacturing firms in Zambia, the identified relationship between effective recycling and cost reduction offers a clear directive. Implementing efficient recycling practices could directly affect their bottom line by minimizing operational expenses. This implication could encourage strategic investment in eco-friendly initiatives to drive financial viability and sustainability simultaneously.

The study's indication that sustainable recycling positively affects market share suggested a compelling opportunity for firms to gain a competitive edge. Embracing and promoting sustainability could not only attract environmentally conscious consumers but also potentially expand market share. This implication underscores the strategic importance of aligning business practices with environmental consciousness in the competitive landscape of Zambia's beverage industry.

The finding regarding the improvement in regulatory relationships through sustainable practices holds significant implications for firms dealing with regulatory complexities in Zambia. Investing in sustainable recycling not only aligns with global environmental goals but also streamlines interactions with regulatory bodies. This implication highlights the potential of sustainability as a strategic tool to navigate regulatory frameworks effectively.

The findings align with prior research emphasizing the cost-saving potential of effective recycling management (Liu et al., 2019; Ali et al., 2019). Similarly, the positive influence of sustainability on market standing echoes findings from previous studies (Grekova et al., 2016).

This study reinforced established findings regarding the positive effect of recycling practices on cost, market share, and regulatory relationships. No significant divergence was observed, consolidating existing knowledge rather than challenging prevailing insights. These results were reinforced by those found from the regression analysis which demonstrated that Recycling Management (X1) held a coefficient of 0.35, indicating that

a one-unit increase in effective recycling management was estimated to result in a 0.35 unit increase in beverage firm performance, all other factors held constant. These results indicated a positive and significant relationship between recycling management and performance of beverage companies in Zambia. Therefore, the null hypothesis was rejected, and the alternative hypothesis was retained.

Beverage manufacturing firms in Zambia should prioritize sustainable recycling practices to drive cost efficiencies, enhance market positioning, and foster smoother regulatory engagements. These findings provided actionable insights that firms can leverage to gain competitive advantages within the local market.

From a theoretical perspective, these results contributed to the broader understanding of how sustainable recycling practices directly influences various facets of firm performance within the Zambian beverage manufacturing context. They validated and reinforced existing theories pertaining to the benefits of sustainable initiatives in business operations.

### **5.1.2 Product Remanufacturing and performance of beverage Manufacturing firms in Zambia**

The study's findings strongly supported the notion that product remanufacturing significantly contributes to environmental sustainability. A substantial 77% of respondents strongly agreed, while 22% agreed with this assertion, reflecting a robust consensus among participants. The high mean score of 4.6 reinforced the overwhelming agreement among respondents, indicating a firm belief in the environmental benefits of remanufacturing practices.

Another key finding highlighted the positive effect of effective product remanufacturing on a company's reputation and brand image. The majority (76%) strongly agreed, with 24% in agreement. The mean score of 4.62 indicated a strong consensus among respondents regarding the association between effective remanufacturing and enhanced brand image, validating its importance in shaping perceptions and market positioning.

This study also indicated a widespread belief in the cost-saving potential of product remanufacturing for beverage manufacturing firms in Zambia. A significant majority (74%) strongly agreed, while 25% agreed, emphasizing a consensus among respondents regarding the financial advantages associated with remanufacturing. The mean score of 4.58 reaffirms the strong alignment of opinions regarding the cost-saving aspect of remanufacturing practices.

Similarly, sustainable product remanufacturing's positive effect on a company's market shares garnered substantial agreement among respondents. With 76% strongly agreed and 23% agreed, this finding underscored the perceived connection between sustainable remanufacturing practices and market share enhancement. The mean score of 4.60 signifies a strong consensus among participants on this aspect.

The alternative hypothesis that claimed that there was a significant statistical relationship between product remanufacturing and organizational performance was retained and the Null hypothesis was rejected. Remanufacturing ( $X_2$ ) had a coefficient of 0.28, suggested that a one-unit increase in remanufacturing practices associated with a 0.28 unit rise in the performance of beverage firms, controlling for other variables.

These findings stress the significance of integrating and promoting product remanufacturing as part of a broader sustainability strategy. For beverage manufacturing firms in Zambia, effective remanufacturing not only contributes to environmental goals but also plays a pivotal role in cultivating a positive brand image. Implementing robust remanufacturing practices could signify a commitment to sustainability, resonating positively with environmentally conscious consumers.

This study's acknowledgment of cost-saving benefits reaffirms the financial advantages associated with product remanufacturing. This implication is pivotal for beverage firms in Zambia, highlighting an opportunity to optimize resource utilization and operational efficiencies, thereby potentially reducing production costs, and improving profitability.

The findings suggested a link between sustainable remanufacturing and market share highlighted a strategic avenue for firms to expand their market presence. Emphasizing

sustainable practices could not only attract environmentally conscious consumers but also potentially capture a larger market share within Zambia's competitive landscape.

This study's findings align with prior research emphasizing the environmental benefits of remanufacturing (Ovchinnikov et al., 2014). Similarly, the positive influence of remanufacturing on cost savings echoes findings from previous studies (Bulmus et al., 2013).

The study reaffirms established insights regarding the positive effects of remanufacturing on environmental sustainability, brand image, cost savings, and market share. No significant divergence from established literature was observed, consolidating existing knowledge on the benefits of effective remanufacturing practices.

Therefore, beverage manufacturing firms in Zambia can leverage the findings to strategize and prioritize product remanufacturing initiatives. These insights underscored the potential for firms to reinforce their environmental commitments, enhance brand perception, achieve cost efficiencies, and expand market presence through sustainable remanufacturing practices.

### **5.1.3 Product Repackaging and performance of Beverage Manufacturing firms in Zambia**

With a mean score of 4.58 and a standard deviation of 0.50, this assertion garnered a high level of agreement. A significant 73% strongly agreed, while 25% agreed, indicating a robust consensus on the positive impact of sustainable repackaging on regulatory relationships.

Similarly, this assertion obtained a mean score of 4.58 and a standard deviation of 0.51, reflecting a high level of agreement among respondents. A notable 72% strongly agreed, while 27% agreed, suggesting a strong belief in the positive relationship between effective repackaging and customer loyalty.

Product repackaging contributes to cost reduction for Beverage manufacturing firms in Zambia. With a mean score of 4.57 and a standard deviation of 0.51, respondents predominantly agreed with this assertion. 70% strongly agreed, and 27% agreed,

indicating a strong consensus on the cost-reduction benefits associated with product repackaging.

Sustainable product repackaging positively effects the company's profitability. Exactly 72% strongly agreed, while 26% just agreed, demonstrating a strong belief in the positive influence of sustainable repackaging on profitability. This assertion also received a mean score of 4.58 and a standard deviation of 0.50, showcasing a high level of agreement among respondents.

Factors of product repackaging that influence the performance of beverage manufacturing firms in Zambia: Brand Image and Marketing, as well as Cost Efficiency combined with Environmental Sustainability, stood out with high percentages of 91.5% and 74.2%, respectively. This indicated that these factors significantly influence the performance of beverage manufacturing firms in Zambia. Following these, Consumer Preferences and Market Trends are somewhat influential at 60.9%, while Regulatory Compliance holds a moderate impact at 70.5%.

The regression results, which indicated Product Repackaging (X3) with a coefficient of 0.18 suggested that, while other parameters stay constant, a one-unit improvement in effective repackaging was related with a 0.18-unit increase in beverage firm performance, supported these findings. It was revealed that Product Repackaging has a positive and significant relationship with beverage firm's performance. The alternative hypothesis was therefore retained, and the null rejected.

Above all, the model for this entire research showcased a considerable explanatory power, with the combined variables of Recycling Management, Remanufacturing, and Product Repackaging accounted for approximately 64% of the variation in the performance of beverage manufacturing companies suggesting that these three variables collectively contribute significantly to explaining changes in firm's performance.

#### **5.1.4 Challenges in Implementing Reverse in beverage manufacturing firms in Zambia.**

The implementation of reverse logistics practices in Zambia's beverage manufacturing sector encounters multifaceted challenges that impede seamless operations. It was established that the main challenges faced were the striking lack of infrastructure and collection systems, highlighted by a staggering 96.3% of respondents. This deficiency hampers the efficient collection and management of recyclable materials, stressing an urgent need for substantial investment in infrastructure development to support reverse logistics endeavours. Similarly, the prevailing consumer behaviour and awareness challenges, marked at 82.7%, emphasize the crucial role of education and awareness campaigns to foster a culture of participation and support for recycling initiatives among consumers.

Regulatory and compliance hurdles, encompassing complexities in regulations (ranging from 52.4% to 81.5%), pose substantial barriers to effective reverse logistics. These challenges included evolving, unclear, and inconsistently enforced regulations, demanding clearer frameworks and consistent enforcement mechanisms to streamline reverse logistics efforts. Moreover, logistical complexities, notably transportation infrastructure (86.3%) and quality control issues (53.9%), necessitate improved infrastructure and coordinated supply chain systems to ensure efficient material flow and maintain product quality throughout the reverse logistics process.

Technological barriers, ranging from sorting challenges to data management (ranging from 42.1% to 90.0%), underscore the need for advancements in technology and infrastructure to facilitate effective reverse logistics operations. Overcoming these hurdles requires investments in innovative sorting mechanisms, improved data management systems, and enhanced technological infrastructure to support efficient reverse logistics practices.

Behavioural change resistance (87.1%) and a lack of awareness (72.0%) represent critical challenges demanding comprehensive education and awareness programs to

drive behavioural change and enhance stakeholder understanding of the importance and mechanics of reverse logistics.

Financial constraints, evident in challenges related to initial investments, operating costs, and market volatility (ranging from 77.1% to 94.8%), underscore the need for sustainable financial models, incentives, and government support to alleviate financial burdens hindering the effective implementation of reverse logistics practices.

Addressing these challenges necessitates a multifaceted approach. Streamlining regulatory frameworks, investing in infrastructure and technology, fostering consumer engagement, and seeking collaborative partnerships are imperative. A comprehensive strategy that integrates educational initiatives, regulatory reforms, technological advancements, and financial support mechanisms will be pivotal in overcoming these hurdles and fostering successful implementation of reverse logistics practices in Zambia's beverage manufacturing sector.

## **5.2 Chapter Five Summary**

The chapter has covered a detailed discussion of study results raised in chapter four of the study. The chapter unveiled all the key findings and details to help provide a meaningful conclusion to the study on the effect of reverse logistics implementation on beverage manufacturing firms in Zambia focused on Zambia breweries Plc. The three predictor variables that is, recycling management, remanufacturing and product repackaging were discussed, and conclusions were made based on the outcome of the hypothesis results.

## **CHAPTER SIX**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **6.0 Introduction**

This conclusive chapter aimed to summarise the core findings of the research and provide practical recommendations for enhancing the performance of beverage manufacturing firms in Zambia. By summarizing the effect of reverse logistics practices on these companies, this section highlighted the significance of actionable insights derived from the study's findings. It aimed to offer strategic guidance for industry practitioners and policymakers in implementing effective reverse logistics strategies. This chapter also recommended direction for future research.

#### **6.1 Summary**

The research extensively analysed the effects of implementing reverse logistics strategies that is recycling management, product remanufacturing and product repackaging on the performance of beverage manufacturing firms in Zambia. The study uncovered robust strong agreement among respondents regarding the positive influences of these strategies on various performance metrics such as cost reduction, market share growth and enhanced profitability.

The findings emphasized the significant relationship between effective recycling management and cost reduction, improved market share, enhanced regulatory relationships and increased profitability for beverage manufacturing firms. These outcomes aligned with established literature and emphasized the strategic advantage of sustainable recycling practices in Zambia's competitive landscape.

The study highlighted the substantial environmental benefits, cost-saving potential, and positive effect on market share associated with effective remanufacturing strategies. These findings also corroborated existing research, reinforced the importance of remanufacturing in bolstering environmental commitments and financial efficiencies within the Zambian context.

The findings also showcased the multifaceted advantages of sustainable product repackaging practices, emphasized their positive influences on regulatory relationships,

customer loyalty, cost reduction, and overall profitability for beverage manufacturing firms in Zambia. These results echoed established literature, underlined the strategic significance of sustainable repackaging within Zambia's beverage industry.

The study identified multifaceted challenges hindering the effective implementation of reverse logistics in Zambia's beverage manufacturing sector. These challenges encompassed the lack of infrastructure and collection systems, consumer behaviour and awareness issues, regulatory complexities, logistical hurdles, technological barriers, resistance to behavioural change, lack of awareness, and financial constraints. Addressing these challenges necessitates a multifaceted approach, including regulatory reforms, infrastructure and technological investments, consumer engagement initiatives, and financial support mechanisms.

## **6.2 Conclusion**

The study's core findings emphasized the pivotal role of reverse logistics practices in influencing the performance metrics of beverage manufacturing firms in Zambia. Effective recycling management, remanufacturing strategies, and product repackaging all have a positive and significance effect on the company's performance. All the objectives of the study were met.

All study alternative hypotheses were accepted. The acceptance of all alternative hypotheses served as compelling evidence affirming that the implementation of reverse logistics profoundly and positively affects the performance of beverage manufacturing firms in Zambia. This implies that the adoption and effective execution of recycling management, remanufacturing, and product repackaging strategies directly contribute to the enhanced operational outcomes and success of these firms in Zambia.

It was concluded that, each time there is an improvement on Recycling Management, remanufacturing and product repackaging, there is a corresponding increase in beverage firms' performance with effect in terms of reduction in cost, market share growth, hence increase in profitability.

The study also indicated that the combined variables of Recycling Management, Remanufacturing, and Product Repackaging could explain approximately 64% of the variation positive effects in these beverage firm's performance in Zambia.

The study's findings indicated that Lack of infrastructure and collection system, technological limitation, consumer behaviour and awareness, and logistical complexities are some of the main challenges faced by beverage firms in Zambia as they try to implement reverse logistics practices.

### **6.3 Recommendations to the study**

The recommendations stemmed from this study were strategically directed towards key stakeholders involved in the beverage manufacturing sector in Zambia and the Zambian Breweries Plc at large where the case study was conducted.

1. The study recommended that Zambian Breweries and other Beverage manufacturing firms in Zambia should adopt the implementation of effective reverse logistics strategies such as recycling management, remanufacturing, and product repackaging to benefits from its significant positive effect on the firm's performance as well as contribute positively to the environmental sustainability of our Nation Zambia as indicated by the study findings.
2. Considering the high significance of challenges like lack of infrastructure, logistical complexities, and regulatory hurdles, Zambian Breweries and other beverage manufacturing firms should prioritize infrastructure development. Government Bodies and Regulatory Authorities should emphasize the need for clearer and consistent regulations, addressing gaps identified in the study's regulatory compliance challenges.
3. Given the technological limitations highlighted in the study, industry players such as Zambia Breweries should invest in advanced sorting and recycling technologies. Additionally, initiatives should focus on consumer education and engagement, bridging the gap in consumer awareness identified in the study. Allocating resources to address financial constraints and prioritizing quality control align with the study's findings on logistical and financial challenges.

4. There should be partnerships between Consumer Groups and Environmental Organizations and industry stakeholders, aiming to bridge the lack of consumer awareness and behavioural resistance identified in the study. Collaborative efforts can reinforce consumer education on sustainable practices, filling a significant gap highlighted in the study.
5. Financial institutions and investors hold a significant role in supporting the cause of effective reverse logistics. Encouraging funding and investment in these initiatives is crucial, emphasizing the pivotal role such endeavours play in sustainability and long-term profitability within the beverage manufacturing landscape in Zambia.

#### **6.4 Limitations of the Study**

One limitation of the study is that the quantitative approach may have restricted the depth of responses from participants, as they had limited opportunity to provide extended opinions about their experiences with reverse logistics implementation. A mixed-methods approach incorporating qualitative interviews could have provided richer insights into the challenges and nuances of reverse logistics practices in the Zambian context.

#### **6.5 Recommendation for future study**

Considering this study's findings revealing that Recycling Management, Remanufacturing, and Product Repackaging collectively account for about 64% of the variation in beverage manufacturing company performance, future research endeavours should focus on exploring additional factors that contribute to the remaining 36% of variation.

Future investigations could investigate into several potential areas for a more comprehensive understanding of the factors impacting the performance of beverage manufacturing firms. Exploring elements such as supply chain dynamics, technological advancements, consumer behaviour, market trends, or broader economic factors could offer valuable insights into the unexplained variation. By probing into these unexplored dimensions, future research could provide a more conclusive perspective on the diverse elements shaping the performance of beverage manufacturing companies in Zambia.

Future research should either do qualitative or mixed research on the same topic as the use of quantitative approach only may have restricted the depth of responses from participants, as they had limited opportunity to provide extended opinions about their experiences with reverse logistics implementation. Incorporating qualitative interviews could have provided richer insights into the challenges and nuances of reverse logistics practices.

### **6.6 Chapter Six Summary**

The chapter concluded on the overall research with specific knowledge generated under conclusion, recommendations, limitations, and recommendation for further research. It was concluded that the implementation of reverse logistics strategies such as recycling management, remanufacturing and product repackaging has a positive significant effect on the beverage firm's performance and all the alternative hypotheses were accepted. The study experienced limitation due to the use of quantitative research approach as Incorporating qualitative interviews could have provided richer insights into the challenges and nuances of reverse logistics practices. The study recommended that Zambian Breweries and other Beverage manufacturing firms in Zambia should adopt the implementation of effective reverse logistics strategies such as recycling management, remanufacturing, and product repackaging to benefits from its significant positive effect on the firm's performance as well as contribute positively to the environmental sustainability of our Nation Zambia. Future research endeavours should focus on exploring additional factors that contribute to the remaining 36% of variation and consider the either the qualitative research approach or mixed research approach.

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## APPENDIX

### SIMILARITY REPORT GBS 800 FINAL DISSERTATION SUBMISSION

#### GBS 800 FINAL DISSERTATION SUBMISSION

##### ORIGINALITY REPORT

<b>18%</b>	<b>13%</b>	<b>8%</b>	<b>12%</b>
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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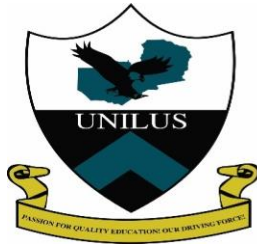
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**Final Thesis Questionnaire**

**TOPIC: ANALYZING THE EFFECTS OF IMPLEMENTING REVERSE LOGISTICS ON  
THE PERFORMANCE OF BEVERAGE MANUFACTURING FIRMS IN ZAMBIA: A  
CASE OF ZAMBIAN BREWERIES PLC.**

**Dear Respondent,**

My name is Peter Kalamwa, currently I am a Master of Science in Procurement, Logistics and Supply Chain Management student at the University of Lusaka (UNILUS) in the school of Post Graduate studies and as part of the requirements for this degree, I'm currently undertaking research on the above topic.

You have been selected purposively to participate in this research, kindly note that your views will represent others that have not been selected in this study. Be assured that the data being solicited here will be put to good while keeping the utmost confidentiality as I process the data. Your cooperation is highly appreciated.

## **SECTION A**

### **(Personal and background Information)**

#### **1. State your age range.**

- a) 18-24 years old
- b) 25-34 years old
- c) 35-44 years old
- d) 45-54 years old
- e) 55-64 years old
- f) 65 years or older

#### **2. Gender**

- a) Male
- b) Female

#### **3. Educational Background**

- a) High School Diploma or Equivalent
- b) Bachelor's Degree
- c) Master's Degree
- d) Doctorate or Professional Degree
- e) Craft Certificate

#### **4. State your job position at Zambia Breweries**

- 1. Frontline employee
- 2. Supervisor/Team leader
- 3. Manager
- 4. Senior manager

**5. How long have you been working at Zambia Breweries?**

- a) Less than 1 year
- b) 1-3 years
- c) 4-6 years
- d) 7-10 years
- e) More than 10 years

**SECTION B**

The following assertions relate to how implementation of reverse logistics influence the performance (measured as Cost, Market Share and Profitability) of Zambian Breweries.

**a) Assertions on the influence of product recycling management and firm performance**

<b>Statements</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>disagree</b>	<b>Strongly disagree</b>
Implementation of effective product recycling management reduces costs					
The implementation of sustainable recycling management positively affects the company's market share.					

Effective recycling management enhances the company's profitability					
Sustainable recycling management practices improve the company's relationship with regulatory authorities					

**Choose any factor (s) among the four of product recycling management that influence the performance of beverage manufacturing firms in Zambia.**

1. Regulatory Compliance
2. Innovation and Technology
3. Consumer Education and Engagement
4. Supply chain integration

**b) Assertions on the influence of product remanufacturing and firm performance**

<b>Statements</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>disagree</b>	<b>Strongly disagree</b>
Zambian Breweries' product remanufacturing strategies contribute to environmental sustainability.					
Effective product remanufacturing					

enhances the company's reputation and brand image					
Product remanufacturing leads to cost savings for Zambian Breweries					
Sustainable product remanufacturing positively impacts the company's market share					

**Choose any factor (s) among the four of product remanufacturing that influence the performance of beverage manufacturing firms in Zambia.**

1. Reverse logistics and collection systems
2. Quality control and certification
3. Economic viability
4. Consumer perception and marketing

**c) Assertions on the influence of product repackaging on firm performance**

<b>Statements</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>disagree</b>	<b>Strongly disagree</b>
Sustainable product repackaging practices positively affect the company's relationship with regulatory authorities.					

Effective product repackaging strategies lead to increased customer loyalty.					
Product repackaging contributes to cost reduction for Zambian Breweries					
Sustainable product repackaging positively impacts the company's profitability					

**Choose any factor (s) among the four of product repackaging that influence the performance of beverage manufacturing firms in Zambia.**

1. Brand image and marketing
2. Cost efficiency and environmental sustainability
3. Consumer preferences and market trends
4. Regulatory compliance

### **Section C**

In this section, the aim is to identify and understand the various challenges that beverage manufacturing firms, particularly Zambian Breweries, encounter when implementing reverse logistics practices within the beverage manufacturing industry in Zambia. Your valuable insights and experiences in navigating these challenges are crucial to this research.

Please take your time to respond candidly to the following questions, sharing your perspectives on the obstacles and difficulties faced during the implementation of reverse logistics strategies at Zambian Breweries. Your input will contribute significantly to the comprehensive analysis of the challenges associated with reverse logistics in the beverage manufacturing sector.

**1. Choose the main challenge (s) you encountered while implementing reverse logistics practices in beverage manufacturing firm.**

1. Lack of infrastructure and collection system
2. Consumer behaviour and awareness
3. logistical complexities
4. Regulatory and legal Hurdles
5. Quality control and contamination

**2. choose any regulatory compliance challenge (s) that hindered the successful implementation of reverse logistics practices.**

1. Complex and Evolving regulations
2. Lack of clarity in regulations
3. Inconsistent enforcement
4. Compliance costs

**3. Choose any logistical complexity (s) that you believe make it difficult to implement reverse logistics effectively in manufacturing firms in Zambia?**

1. Transportation infrastructure
2. multiple collection points
3. quality control and sorting
4. Reverse supply chain coordination

**4. Overall does the organization culture and structure support adopting and execution of reverse logistics practices?**

Agree

Strongly agree.

Neutral

Disagree

Strongly disagree.

**5. Choose any technological limitation (s) that impacted the implementation of reverse logistics initiatives?**

1. Sorting and Recycling technology
2. information access and communication
3. Data collection and management
4. lack of IT infrastructure

**6. Choose any challenge (s) related to consumer perception of environmentally sustainable reverse logistics practices.**

1. Behavioural change resistance
2. Trust and credibility
3. perceived inconvenience
4. Lack of awareness

**7. Choose any financial constraint (s) or limitation (s) that affect the ability of Beverage manufacturing firms in Zambia to invest in and carry out effective reverse logistics activities.**

1. Initial investment costs
2. Operating costs
3. market volatility
4. Competing financial priorities
5. Lack of government support

**Thank you for your participation.**



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All correspondence should be addressed to the Vice Chancellor

02<sup>nd</sup> November, 2023

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: DATA COLLECTION REQUEST- ANALYSING THE EFFECTS OF IMPLEMENTING REVERSE LOGISTICS ON THE PERFORMANCE OF BEVERAGE MANUFACTURING FIRMS IN ZAMBIA

This letter serves to introduce PETER KALAMWA Identity Number MSCPLSM22113416 as a bona fide student of the University of Lusaka pursuing Master of Science in Procurement, Logistics and Supply Chain Management Studies.

PETER KALAMWA is required to submit a Dissertation as part of the requirements for the award of a Master of Science in Procurement, Logistics and supply Chain Management Studies and therefore seeks to collect data from your institution. His Dissertation title is stated above. The data will be used solely for Academic purposes and a copy of the final document can be availed to you upon request.

Any assistance given to him will be greatly appreciated.

Yours faithfully,

(PP) Mwamba Chanda (Mr.)  
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Ref no: FWA00033228-3312/23

Date: 10<sup>th</sup> December 2023

**STUDENT NAME: PETER KALAMWA**

**ANALYSING THE EFFECTS OF IMPLEMENTING REVERSE LOGISTICS ON  
THE PERFORMANCE OF BEVERAGE MANUFACTURING FIRMS IN ZAMBIA.  
A CASE OF ZAMBIAN BREWERIES NDOLA PLANT**

The above research was submitted to the research ethics committee for review.  
The study has no major ethical problems and is approved subject to the following:

1. The study cannot be changed without express permission of the UNILUS research ethics committee.
2. Approval from the necessary authority should be sought.

**Congratulations and the committee wishes you success in your work.**



---

**Professor Kasonde Bowa**  
MSc(Glasgow),M.Med(UNZA),FRCS(Glasgow),FACS,FCS,DPH(LSTMH),MPH(UCL)  
Chairman- UNILUS REC  
Professor of Urology and Consultant Urologist  
Deputy Vice-Chancellor – Research and Innovation  
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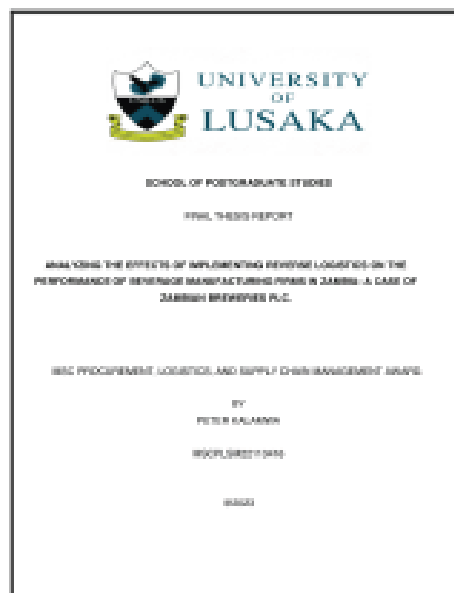


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