



Investigating the development and implementation of green supply chain strategies by South African consumer goods manufacturers

D Britz

 **orcid.org/0009-0002-9972-8132**

Mini-dissertation accepted in partial fulfilment of the requirements for the degree *Master of Business Administration* at the North-West University

Supervisor: Dr N Mouton

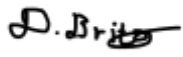
Graduation: July 2025

DECLARATION

I hereby declare that the mini dissertation submitted herewith to North-West University in partial fulfilment of the requirements for the Master of Business Administration (MBA) degree is my original work. It has been text-edited in accordance with professional communication standards and has not been previously submitted to any other institution for evaluation purposes.

I affirm that all sources used in the preparation of this assignment have been duly acknowledged and that any potential conflict of interest related to this assignment has been disclosed.

By signing this declaration, I take responsibility for the submission and confirm that the work complies with the university's policies on academic integrity.

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Britz, Dewalt	28507428	29/07/2024	

ABSTRACT

This study investigates the development and implementation of green supply chain strategies. The study explores the motivations, strategies, challenges, and impacts of green supply chain management. Key drivers include cost reduction, sustainability, ethical considerations, and regulatory compliance. The integration strategies encompass delivery process optimisation, energy optimisation, research and innovation, supplier collaboration, KPI integration, and recyclability. Despite the benefits, implementing green supply chain strategies faces challenges such as stakeholder alignment, lack of knowledge, initial investment, and cost management. The impact analysis reveals that green supply chain processes lead to cost efficiency, operational improvements, reputation enhancement, and CO² reduction. The findings underscore the importance of aligning environmental goals with business objectives and the need for continuous innovation and collaboration with suppliers to achieve sustainability targets. This research provides valuable insights into developing and implementing South African consumer goods manufacturers' green supply chain strategies, highlighting the critical role of cost-benefit analysis, stakeholder engagement, and continuous improvement in achieving sustainability goals.

The **research methodology** adopted in this study is qualitative, involving semi-structured interviews with professionals from one of South Africa's leading dairy product producers. The study employs thematic analysis to identify key themes and patterns in the data. The interviews were conducted online, recorded, and transcribed for analysis. The study's trustworthiness is ensured through credibility, transferability, dependability, and confirmability.

The **following recommendations for further studies** were made: To investigate how corporate key performance indicators can be used as a model to implement green supply chain strategies. To explore South Africa's public transport infrastructure to identify supply chain channels that are more cost-effective and environmentally friendly. Investigate how small and medium-sized firms implement green supply chain strategies. Conduct a qualitative investigation on multiple firms to understand the country's most effective green supply chain strategies in terms of environmental impact and cost saving.

Keywords: Green, management, supply chain, strategy, carbon, emissions.

LIST OF ABBREVIATIONS

KPI	Key Performance Indicators
CHP	Combined Head and Power
CO ₂	Carbon Dioxide
FMCG	Fast-Moving Consumer Goods

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Environmental concerns such as natural resource depletion, pollution, rising temperatures and a decreased biodiversity are leading to a weaker ecological balance (Yildiz Çankaya & Sezen, 2019:98). This has led to increased social awareness on environmental issues, and this can influence organisations' reputation, stated by Walker *et al.* (2008:72). Aspects like environmental legislation, stakeholders and globalisation are increasing pressure on organisations to implement more environmentally friendly practises. This is why there is a growing interest in green supply chain management, as explained by Abdel-Baset *et al.* (2019:210). Competitive advantage, higher profits, waste reduction and innovation also motivate the implementation of a more sustainable supply chain (Zimon *et al.*, 2020:219).

South Africa's manufacturing sector contributes to employment and economic growth. Unfortunately, it also negatively impacts carbon emissions (Fatoki, 2019:10). South Africa accounted for 1,07% of global emissions in 2020 (United Nations, 2021). The country's carbon emissions increased by 27% between 1999 and 2015, with the manufacturing industry accounting for 20% of total emissions in 2015 (Kan *et al.*, 2020:446). Apart from social and global pressure on carbon emission reduction, the South African government has also set the goal to reach net zero emissions by 2050 through its low-emission development strategy (United Nations, 2021). These aspects will challenge the South African manufacturing sector to implement green supply chain practices promoting sustainable production (Epoh *et al.*, 2024:2).

Hervani *et al.* (2005:331) defined supply chain management as activities involved in supplying a finished good to the consumer. Srivastava (2007:54) defined green supply chain management as integrating environmental thinking into supply chain management. This is supported by Awan *et al.* (2022:2), who stated that green supply chain management integrates environmental requirements into supply chain operations.

This study aims to motivate further investigation into how South African consumer goods manufacturers develop and implement green supply chain strategies. The remainder of this chapter is organised as follows: the problem statement and a brief literature review, followed by the primary and secondary objectives, the main research question, the scope of the study, and the ethical considerations.

1.2 Problem Statement

Mvubu and Naude (2016:294) suggested further studies into green supply chain constraints for upstream and downstream role-players in the fast-growing South African consumer goods industry. Jansen van Rensburg (2015:219) suggested further research on green logistics activities of different transport modes. It was also pointed out that studies on the environment and process transformation to a more sustainable business can be beneficial. Epoh and Mafini (2018:10) suggested further studies on South African green practices other than green procurement, design, reverse logistics and legislation. Epoh *et al.* (2024:16) recommended investigating how manufacturing firms can leverage green supply chain strategies to unlock competitive advantage. Considering these recommendations and the South African government's 2025 net-zero goal, there needs to be more understanding of how green supply chain strategies are implemented throughout all components and what challenges and outcomes these strategies entail.

Understanding how South African consumer goods manufacturers implement green supply chain strategies is necessary. The problem investigated in this research paper will focus on these strategies, the barriers firms face, and the primary motivations for implementing a green supply chain.

1.3 Literature Review

Hervani *et al.* (2005:334) identified three main green supply chain management elements: procurement, manufacturing, and Reverse logistics. Srivastava (2007:56) divided the literature on green supply chain management into three broad categories: The importance of green supply chain management, green design and green operations. Srivastava's (2007:56) operations category included Hervani *et al.* (2005:334) elements with the addition of waste management. Yildiz Çankaya and Sezen (2019:99) identified eight elements of green supply chain management, most mentioned by Hervani *et al.* (2005) and Srivastava (2007), with an addition of green marketing, environmental education, and investment recovery. Rostamzadeh *et al.* (2015:191) identified *green design, purchasing, production, warehousing, and transportation as the elements of a green supply chain.*

This section will explore how literature defines and implements green supply chain components identified by Srivastava (2007:56) with the addition of green marketing and distribution identified by Yildiz Çankaya and Sezen (2019:99).

1.3.1 Green Procurement

Lacroix (2008:2) stated that green procurement is a tool for improving an organisation's products and processes from an environmental perspective. Green procurement is the concept of purchasing materials, products or services that have a low environmental impact through their life cycle (Lacroix, 2008:2). Green procurement practices can be divided into three categories (Blome *et al.*, 2014:33):

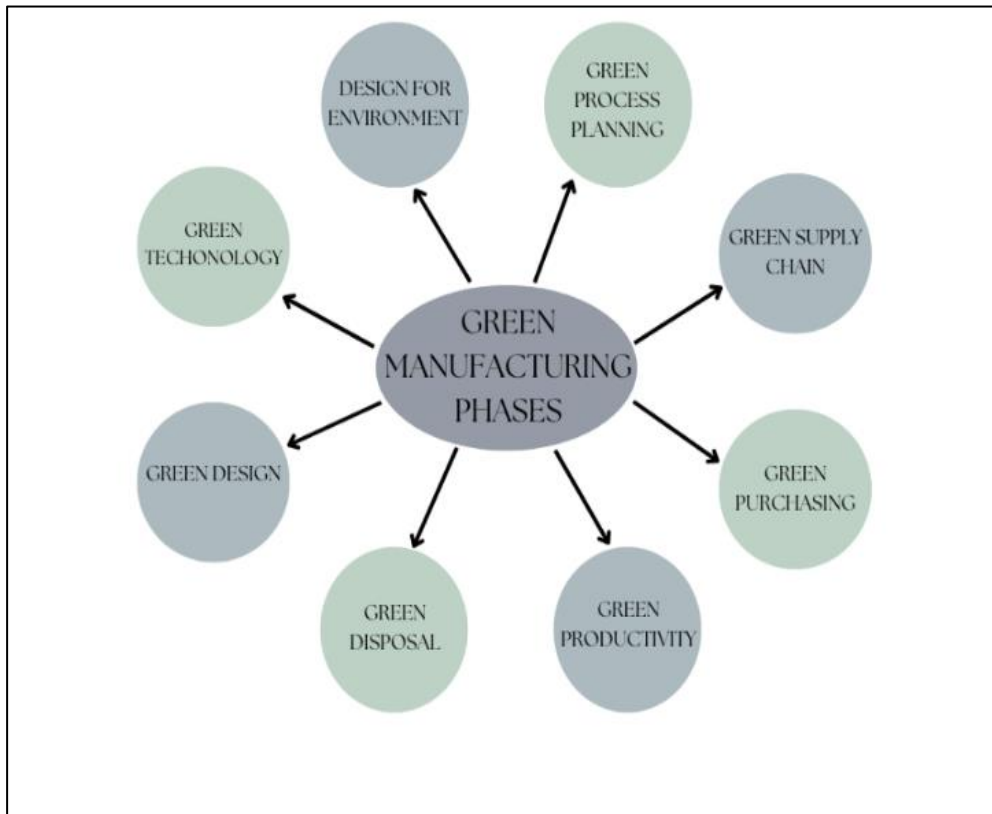
- The organisation designs and develops its products to increase the demand for green materials.
- Select suppliers who adhere to green standards like the ISO certifications.
- Supplier development practices where the firm collaborates with suppliers to reduce environmental impact.

Lacroix (2008:3) stated that the environmental impact of a product should be measured over the product or materials' entire life cycle. The life cycle impact includes the environmental impact of a product at raw material sourcing, distribution, production and disposal (Lacroix, 2008:3). Advantages of green procurement include decreased waste cost, increased innovation, and improvement of the organisation's image (Lacroix, 2008:4).

1.3.2 Green Manufacturing

Logesh and Balaji (2021:365) defined green manufacturing as using product and process design to reduce waste and pollution. This internal manufacturing process includes waste reduction, recycling, reengineering, remanufacturing, and using more environmentally friendly alternatives (Logesh and Balaji, 2021:366). According to Logesh and Balaji (2021:366), there are eight phases of green manufacturing. These phases can be observed in Figure 1. Logesh and Balaji (2021:366) explained that these phases are generally used as environmental awareness plans, policy implementation, or objectives.

Figure 1: Phases of Green Manufacturing



Source: Logesh and Balaji (2021:367)

Belekar (2017:2668) listed five advantages of green manufacturing:

1. Green manufacturing reduces waste in the product production cycles.
2. Increased capital preservations.
3. Increased productivity and cost reduction.
4. Green manufacturing influences internal and external behaviour to ensure sustainability.
5. Increased adaptability to environmental regulations changes.

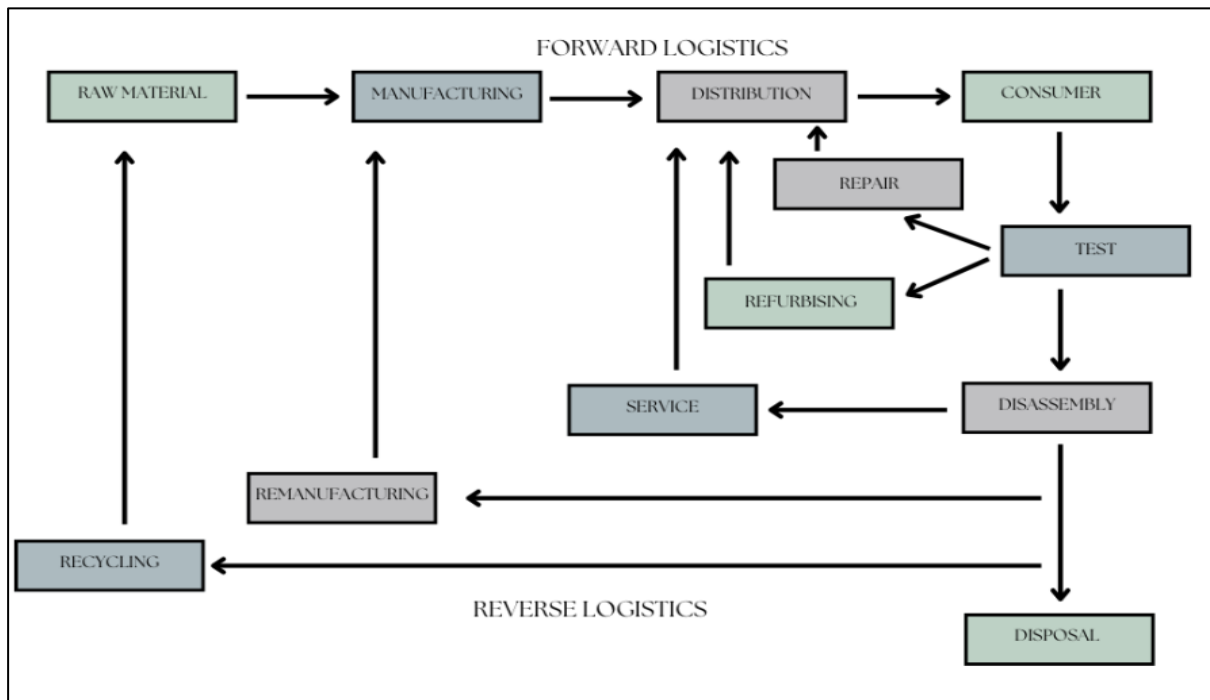
1.3.3 Reverse and Green Logistics

Logistics aims to move a product from the point of origin to the end of consumption. Reverse logistics focuses on moving products or materials from the point of consumption to the point of origin, as explained by Rogers and Tibben (2001:130). There is a difference between reverse and green logistics. Rogers and Tibben (2001:130) state that green logistics focuses on activities that reduce the environmental impact. Reverse logistics concentrate on the flow of products.

Gechevski *et al.* (2016:65) support this view on reverse logistics, stating it is the recycling, remanufacturing, or disposal of products or parts of products shipped to the point of consumption.

Figure 2 shows the forward and reverse logistics flows, as Gechevski *et al.* (2016:66) explained. This indicates the flow of material from the point of consumption to be tested, disassembled, remanufactured, recycled, or disposed of.

Figure 2: Forward and Reverse Logistical Flows.



Source: Gechevski *et al.* (2016:66)

1.3.4 Green Product Design

Chen *et al.* (2020:224) stated that product development involves designing, creating, and marketing a new product to consumers. Consistent product development is critical for an organisation to keep up with market trends and ensure future profitability (Chen *et al.*, 2020:224). Arnette *et al.* (2014:7) stated that a product design can reduce environmental impact. Designing products for recyclability, remanufacturing, life cycle, and the environment can reduce the ecological impact (Arnette *et al.*, 2014:7). Design for recyclability focuses on all materials used to make the products recyclable. If a material is not recyclable, an alternative needs to be used, as explained by Arnette *et al.* (2014:7). Design for remanufacturing entails developing a product that can be disassembled, cleaned, refurbished, and reassembled to be used again (Arnette *et al.*, 2014:7). Design for life cycle considers the impact of the product throughout its usable life, stated by (Arnette *et al.*, 2014:7). Lastly, designing for the environment considers environmental and health challenges when designing new products and processes (Arnette *et al.*, 2014:7).

1.3.5 Green Marketing

Sohail (2017:230) explained that green marketing originates from ecological marketing; this refers to the marketing's environmental impact. Sohail (2017:230) states that green marketing strategies focus on meeting consumer expectations and addressing environmental concerns. Davari and Strutton (2014:565) identified four main green marketing mixes that can be utilised. The first is green products produced with environmentally friendly processes. Green prices refer to the premium suppliers must pay for environmentally friendly products. Davari and Strutton (2014:565) explained that the higher price is due to the higher production cost of green products. Green promotion is a tactic that can be used to convince potential clients to use green products. Lastly, the green place tactic decides how to make green products available and distribute them to clients (Davari & Strutton, 2014:566).

1.4 Primary and Secondary Objectives

The primary objective is to explore how consumer goods manufacturers implement green supply chain strategies in South Africa. This will be done by examining the following range of secondary objectives.

- To investigate what internal strategies are implemented to promote a green supply chain.
- To Identify barriers to implementing a green supply chain for a South African consumer goods supplier.
- To identify what motivates South African fast-moving consumer goods manufacturers to implement green supply chain practices.
- To evaluate the impact of these practices on sustainability and cost efficiency.

1.5 The Scope of The Study

- Field of the Study: The study focuses on operational management, specifically green supply chain management.
- Industry: This study will focus on the consumer goods manufacturing industry.
- Geographical demarcation: The study will focus on the South African industry and be conducted in the Gauteng province with one of South Africa's leading consumer goods manufacturers.

1.6 Conclusion

This study focuses on how South African consumer goods manufacturers implement green supply chain strategies by investigating how firms implement green supply chain strategies. The literature

review briefly explored the broad concepts of green supply chain management, which include green procurement, manufacturing, reverse logistics, product design, and marketing. Chapter two explores the existing literature on the motivation, practises and challenges of implementing a green supply chain. This research aims to provide valuable knowledge on the best practices, opportunities, and barriers South African consumer goods manufacturers face when implementing green supply chains. Chapter three explains the research methodology followed in this study and includes the study's findings per theme. Chapter four discusses the key findings, limitations and recommendations for further research.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter explores the existing literature on developing and implementing green supply chain strategies, focusing on the motivations, strategies, and challenges organisations face. This chapter aims to provide a comprehensive understanding of the theoretical foundations and empirical studies that have shaped the current knowledge in this field. The literature review begins by exploring the main motivations for implementing green supply chains: cost reduction, sustainability, ethical considerations, and regulatory compliance. It then examines various green supply chain management strategies, including green procurement, manufacturing, logistics, product design, and marketing. The chapter also addresses the challenges of implementing these strategies, such as high investment costs, lack of knowledge, and stakeholder alignment.

2.2 The Main Motivations for Implementing Green Supply Chains

Firms can be reluctant to adopt a green supply chain due to the risks and costs to the organisation. Therefore, it is essential to understand what motivates firms to implement green supply chains. Perotti *et al.* (2013:6) investigated the main motivations and barriers to implementing green supply chain management in the third-party logistics industry in Italy. The organisations in this study operate in the chemicals, food, and pharmaceutical industries. Interviews and questionnaires were used to conduct 15 case studies of third-party logistics (Perotti *et al.* 2013:6). Five motivation categories were investigated:

1. Coercive motivator: This study revered regulations imposed nationally (Perotti *et al.* 2013:10).
2. Consumers and society motivator: This motivation is based on pressure from local and international consumers. It includes the environmental awareness of consumers, the environmental awareness of firms, and the media's focus on the industry (Perotti *et al.* 2013:10).
3. Supplier motivator: This focused on suppliers' capability to implement green initiatives, establish environmental supplier partnerships, and remain in business (Perotti *et al.* 2013:10).
4. Competitors motivator: This factor looks at the competition's ability to implement green strategies at the same efficiency level (Perotti *et al.* 2013:10).
5. Internal motivator: This refers to internal motivators like development budgets, environmental missions and reputation (Perotti *et al.* 2013:10).

Perotti *et al.* (2013:10) rated the results as irrelevant, moderately relevant, and highly relevant, or a score out of 15. Table 1 demonstrates the most pertinent motivators and describes what Perotti *et al.* (2013:10) found to be the critical relevance factor.

Table 1: Motivators for Green Supply Chain Adoption.

Motivators	Description	Score
Coercive motivator	The factor of national and regional environmental regulations was the most relevant. This seemed more relevant for firms handling environmental hazardous materials (Perotti <i>et al.</i> 2013:9).	13 out of 15
Consumers and society motivators	Enhancing the firm green image was found to be the main factor. Green supply chain management has been implemented due to firms' need to promote themselves as green (Perotti <i>et al.</i> 2013:9).	10 out of 15
Internal motivator	Environmental reputations were the critical factor. This also showcases that third-party logistic firms in Italy are in more environmental conditions than in the past (Perotti <i>et al.</i> 2013:9).	12 out of 15

Source: Perotti *et al.* (2013:9)

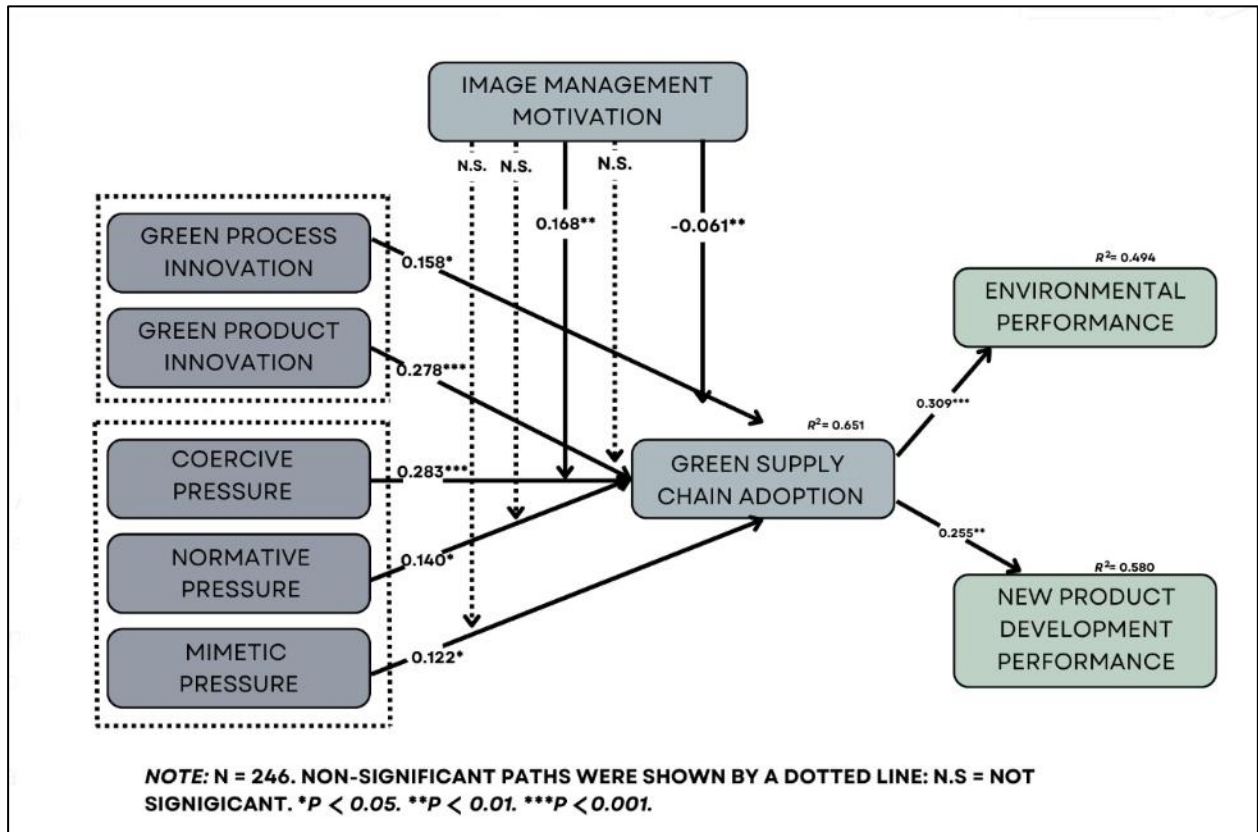
Perotti *et al.* (2013:9) found supplier-related factors irrelevant as a motivator for implementing green supply chain management strategies. The same was true for competitor-related factors; however, competitor factors were slightly more relevant than supplier-related factors (Perotti *et al.*, 2013:9). This was in direct contrast to what Wang and Zang (2023:10) found.

Wang and Zhang (2023:3) identified the following five motivations for green supply chain adaption:

1. Image management motivation: This includes improving an individual's social image. On an organisational level, firms will use different image management strategies to control how stakeholders view them (Wang & Zhang, 2023:05).
2. Green innovation: Wang and Zhang (2023:4) stated that the main reason to implement green supply chain management is to solve the problematic relationship between organisations and the natural environment. Therefore, high green innovations will prompt firms to implement environmental considerations into their supply chain.
3. Coercive pressure: This refers to policy and institutional pressure from the government regarding good environmental practices (Wang & Zhang, 2023:05).
4. Normative pressure: This is pressure from all the firm's stakeholders, including consumers, nonprofit organisations and suppliers (Wang & Zhang, 2023:05).
5. Mimetic pressure: Pressure resulting from competitors implementing green supply chain strategies to win consumer preference (Wang & Zhang, 2023:05).

Wang and Zhang (2023:10) created a model to understand if these factors influence the motivation for the adoption of green supply chain strategies. This hypothesis model can be observed in Figure 3.

Figure 3: Green supply chain motivation model



Source: Wang and Zang (2023:10)

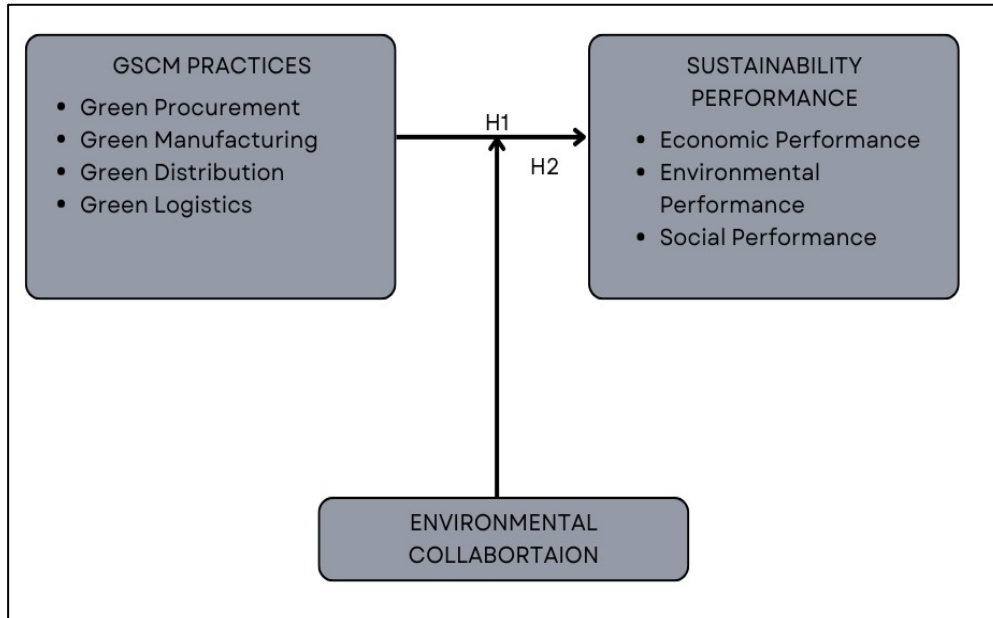
Wang and Zhang (2023:7) conducted a quantitative study and tested their hypotheses using reliability and validity. All identified motivations were found to be significant except image management motivation (Wang and Zhang, 2023:10). However, it was found that this motivation had a positive effect on the relationship between coercive pressure and green supply chain adoption.

2.3 Green Supply Chain Management Strategies

Chin *et al.* (2015:697) developed a conceptual model linking the relationship between green supply chain practices, sustainable performance, and environmental collaboration. This model can be observed in Figure 4. In this model, Chin *et al.* (2015:697) identified green procurement, manufacturing, distribution, and logistics as the green supply chain practices. As Chapter One mentions, this is supported by Hervani *et al.* (2005:334), who focussed on procurement,

manufacturing, and reverse logistics. However, this model excludes Srivastava's (2007:56) green design practice and Yildiz Çankaya and Sezen's (2019:99) green marketing practice.

Figure 4: The Conceptual Model for Green Supply Chain Practises



Source: Chin *et al.* (2015:697).

Agility (2021) identified six practices for ensuring a more sustainable supply chain and widely used techniques for greener operations. Table 2 sets out the practices Agility (2024) identified, and the methods identified per practice. The practices in Table 2 are more aligned with Hervani *et al.* (2005:334), Srivastava (2007:56), and Rostamzadeh *et al.* (2015:191) theories discussed in Chapter One.

Table 2: Green Practices and Techniques

Practices	Description of techniques used
Green purchasing	This refers to supporting suppliers who provide environmentally sustainable products and services. Ethical and sustainable sourcing is the cornerstone of a green supply chain. This can include sourcing recyclable materials or sustainable harvests (Agility, 2021).
Green Manufacturing	This practice focuses on reducing carbon emissions, using fewer non-renewable natural resources, and reducing waste. One of the most significant concepts is reducing energy consumption in manufacturing by using alternative energy sources like hydropower, solar, biofuels, and wind energy (Agility, 2021).
Green Packaging	This refers to the packaging life cycle and includes everything from how it was sourced to how it was consumed. In practice, this can consist of using paper and cardboard as packaging material, as they are recyclable, or using biodegradable packaging that will naturally decompose (Agility, 2021).

Green Warehousing	Ensure the warehousing operations run more efficiently by reducing waste and energy consumption (Agility, 2021).
Green Transportation	Reducing transport emissions by coordinating to reduce the number of freight shipments. This can also include using other means of transportation, like rail, that use less fuel and can carry more cargo (Agility, 2021).
Life-Cycle Management	To ensure that products are designed to be environmentally friendly throughout their entire lifecycle (Agility, 2021).

Source: Agility (2021)

Martins *et al.* (2019:4) investigated how Brazilian firms implement sustainable practices into their supply chains by analysing 30 organisations' published sustainability reports. Strategies were grouped into five macro categories. For the purpose of this paper, we only reported the first four macro categories, as the last macro area focuses on employee transport and management (Martins *et al.*, 2019:7).

Table 3: Environmentally sustainable practices implemented in Brazil

	Macro Area One: Transport type, routing, and vehicle use	Percentage of firms implementing the practice.
1	Firms make use of electric vehicles.	7%
2	Choose transport mediums that have less of an environmental impact.	27%
3	Tracking fuel consumption of vehicles.	10%
4	Delivery optimisation via route planning.	27%
	Macro Area Two: Sustainable warehouse practices	
1	Operational safety practices to improve working conditions.	17%
2	Rainwater collection to be used in operations.	3%
3	The use of solar panels to generate power.	3%
4	The use of electric trolleys.	3%
5	Use more eco-friendly fuel for forklifts.	3%
6	Waste mapping in picking operation.	10%
	Macro Area Three: Sustainable practices related to suppliers and purchasing	
1	Supplier selection criteria are based on environmental practices, labour regulation compliance, sustainable certifications, an ethical code of conduct, and an anti-corruption programme.	57%
2	Supplier development programs with sustainable criteria.	23%
3	Social and human rights criteria are included in the purchasing policy.	10%
4	Local sourcing practises.	10%
	Macro Area Four: Packaging management practises.	
1	Reuse, recycle, and reverse logistics practices.	27%
2	Packaging material reduction.	17%

3	Recycled materials are used in the packaging process.	3%
4	Campaigning and informing people to motivate the use of sustainable packaging.	3%
5	Designing packaging to optimise the handling of the goods.	7%

Source: Martins *et al.* (2019:8)

Martins *et al.* (2019:8) findings of practical implementation align with Chin *et al.* (2015:697) conceptual framework and with Agility's (2021) green practices. However, based on these findings, most firms in this study implement green practices by engaging with suppliers, ensuring that green procurement is practised. However, strategies like delivery optimisation, choice of transport medium, reuse and reverse logistics are also prominent strategies implemented.

2.4 Challenges of Implementing Green Supply Chain Practices

Perotti *et al.* (2013:13) indicated two main implementation barriers: internal and external. Internal barriers include high investment, lack of competencies, negative economic impact, and cost-benefit measurement (Perotti *et al.*, 2013:10). External barriers include only customers' and suppliers' interest in green products and services. Perotti *et al.* (2013:14) stated that the interests of consumers and suppliers are the most relevant barrier to the incapability to identify the cost-benefit.

Hebaz and Oulfarsi (2021:126) conducted an in-depth literature review to identify the key drivers and barriers to implementing green supply chain management. The barriers were also divided into internal and external and rated based on the number of citations (Hebaz & Oulfarsi, 2021:127). Eighteen internal barriers were identified, with 84 citations, and 13 external barriers had 58 citations. Table 3 shows all the internal and external barriers identified in Hebaz and Oulfarsi's (2021:126) review with the percentage of citations the barrier represents per category.

Table 4: Green Supply Chain Management Implementation Barriers

Internal Barriers	Percentage
Implementation cost	17%
Lack of human and financial resources	15%
Low top management commitment	12%
Company culture and corporate responsibility acceptance	11%
Lack of knowledge	8%
Low integration of information technology	7%
Price competitiveness	5%
Low green practice acceptance	5%
Cost measurement difficulties	4%
Lack of environmental performance matrix	4%
Resistance to change	2%
Product design complexities	2%

Firms have a fear of failure	2%
Shortage of the needed certification	1%
Strategy planning complexities	1%
Lack of third-party logistics partners	1%
Lack of environmental audits	1%
Compliance complexities	1%
External Barriers	Percentage
Regulations	24%
Lack of supplier acceptance of green supply chain management	24%
Consumer factors such as price and lack of awareness	21%
Industry	5%
Low pressure from society	5%
Corruption	3%
Lack of financing in terms of loans	3%
Low green process exposure of professionals	3%
Market uncertainty	3%
Financial crises (Global)	2%
Lack of research and innovation	2%
Transport systems	2%
Low promotion of green materials in the local market	2%

Source: Hebaz and Oulfarsi (2021:127)

Hebaz and Oulfarsi's (2021:126) top 75% of internal barriers are related to Perotti *et al.*'s (2013:13) internal barriers of high investment cost, competencies, cost maturation, and economic impact. The top 69% of the external barriers include Perotti *et al.*'s (2013:13) consumer and supplier barriers. However, Hebaz and Oulfarsi (2021:126) have an addition of regulations not identified by Perotti *et al.* (2013:13).

Adebayo *et al.* (2024:99) agreed that regulation can be a barrier for firms to implement green practices. However, this can be overcome by implementing a comprehensive sustainable policy and training professionals to uphold the policy. The firm policy should align with regulations and be constantly reviewed to ensure it remains relevant to regulatory changes (Adebayo *et al.*, 2024:100).

Adebayo *et al.* (2024:99) and Esan *et al.* (2024:1934) agreed that implementing sustainable practices in a supply chain can reduce costs and increase competitive advantage. This counters Hebaz and Oulfarsi's (2021:127) and Perotti *et al.*'s (2013:13) findings on implementation cost. Adebayo *et al.* (2024:101) explained that sustainable practices can be perceived as an additional cost but can lead to economic benefits that outweigh the investment cost. Firms can reduce the cost of waste, energy and maintenance by selecting more sustainable products and services.

Adebayo *et al.* (2024:101) stated this claim with the support of an example of energy-efficient lighting. Using this type of lighting may have a higher implementation cost but lead to a sustainable cost saving on utilities.

2.5 Conclusion

Chapter 2 provided an in-depth review of the existing literature on green supply chain strategies, focusing on the motivations, strategies, and challenges faced by South African consumer goods manufacturers. The chapter explored the primary motivations for adopting green supply chains: cost reduction, sustainability, ethical considerations, and regulatory compliance. It highlighted the importance of these drivers in encouraging organisations to integrate environmental thinking into their supply chain operations. Various green supply chain management strategies, including green procurement, manufacturing, logistics, product design, and marketing, were examined. These strategies were identified as essential for reducing the environmental impact of supply chain activities and achieving sustainability goals. The review also addressed the significant challenges of implementing green supply chain practices, such as high investment costs, lack of knowledge, and stakeholder alignment. These barriers were found to hinder the adoption of green practices and require careful consideration and management.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

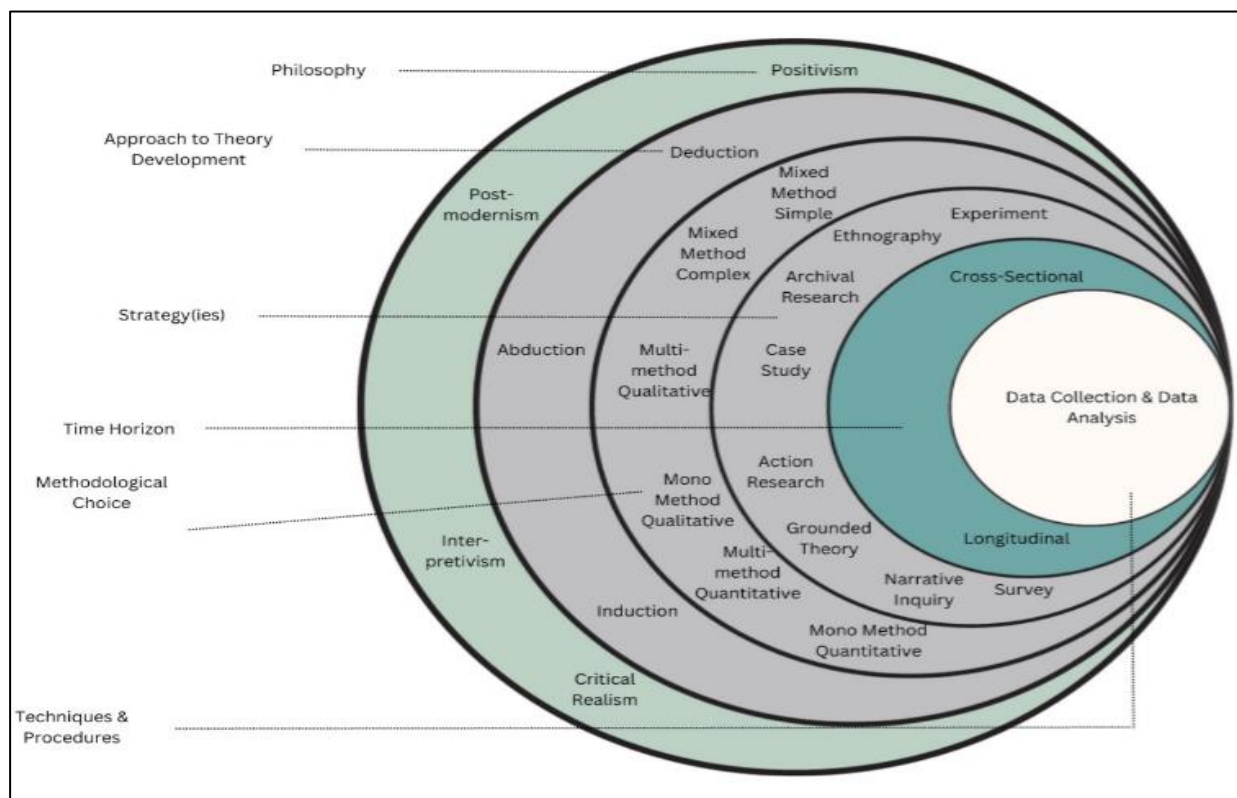
This chapter provides a detailed account of the research methodology employed in this study to investigate the development and implementation of green supply chain strategies by South African consumer goods manufacturers. The research design, data collection methods, and analysis techniques offer a comprehensive understanding of the empirical study conducted. The chapter begins with an overview of the research paradigm and approach, highlighting the interpretivism paradigm adopted to understand the motivations, strategies, and challenges associated with green supply chain management. This is followed by describing the measurement instruments used, including semi-structured interviews with professionals from one of South Africa's leading dairy product producers. The data collection process is elaborated upon, detailing the participant selection, interview procedures, and the average duration of the interviews. The chapter also addresses the study's trustworthiness, ensuring credibility, transferability, dependability, and confirmability through rigorous documentation and verification of findings with participants. Ethical considerations are discussed, emphasising compliance with the South African Protection of Personal Information Act (POPI) and the voluntary nature of participation. Finally, the chapter concludes with an explanation of the data analysis process, employing thematic analysis to identify key themes and patterns in the data.

3.2 Empirical Study

Hox and Boeije (2005:593) explained that primary data are new and can be added to existing data. Primary data are collected for a specific research problem, emphasised by Hox and Boeije (2005:593). The primary data needed for this study have been collected using an empirical study on how South African consumer goods manufacturers implement and manage a green supply chain.

The research design of this study's empirical investigation involves determining the research paradigm, approach, methodological choice, research strategy, time horizon, study population, and sampling. This strategy is based on Saunders *et al.* (2009:108) research onion, which can be observed in Figure 5.

Figure 5: The Research Onion



Source: Saunders *et al.* (2009:108)

Considering the nature and objectives of this study, mono-method qualitative research has been conducted.

3.3 Research Paradigm

Saunders *et al.* (2009:118) defined a paradigm as a way of examining social phenomena. Various research paradigms exist, but this study will focus on positivism and interpretivism.

Bryman *et al.* (2021:31) explained that the positivism paradigm requires the researcher to use natural science methods to explain social reality. Saunders *et al.* (2009:119) stated that the interpretivism paradigm is subjective; the focus is on the reality behind the details.

Due to the nature of this study's primary and secondary objectives, which are to understand how and why the topic is being implemented, an interpretivism paradigm will be adopted.

3.4 Research Approach

This study has adopted an interpretivism paradigm. Therefore, an inductive research approach has been followed. Qualitative research has been conducted. Chapter two has identified known

motivations, strategies, challenges, and effects of green supply chain integration. Semi-structured interviews with one of South Africa's leading dairy product producers' employees have been conducted to identify what they do regarding green supply chain management and practices. This study is cross-sectional, as the investigation will have been done over a single period.

3.4.1 Designing the Measurement Instrument

Bryman *et al.* (2021:268) stated that interviews and focus groups are standard methods to use for research. This study will sample raw data directly from willing participants. Semi-structured interviews are used as a measuring tool for this study. This allows the researcher to cover a range of topics, as stated by Bryman *et al.* (2021:270)

According to Bryman *et al.* (2021:270), the interviewer uses prepared questions from the interview schedule in a semi-structured interview. However, the interviewer can ask follow-up questions, which vary from the schedule.

3.4.2 Data Collection

One-on-one interviews were conducted with manufacturing, product development, and supply chain professionals. Interviews were conducted online via Teams, and participants were contacted by email to arrange the interview based on their available time. The average duration of the interviews was 24,4 minutes. Background information about the study was provided on the interview request. All participants gave permission to record the interview, and they were reminded that participation is optional. All interviews were transcribed, and the researcher's notes before and after the interviews are available in the appendix. Atlas.ti was used to code the data and merge codes where needed.

The population comprises professionals and managers employed in the well-known dairy consumer goods organisation. The participants are part of the operational, product development, planning, warehousing, procurement, and supply chain departments. Participants employed in the finance or sales departments were excluded from the study due to their low level of engagement with the study topic.

Non-probability sampling, specifically purposive sampling, was used. Bryman *et al.* (2021:224) stated that for purposive sampling, the researcher aims to sample participants strategically. This method will help ensure the sample comprises possible participants with relevant skills and employment to the study.

The study reached data saturation when interviewing Participant 6 as it became clear that the organisation uses its impact journey strategy to align KPIs across different departments with strategic and environmental goals. This allows different departments to implement cost—and green-focused strategies that align with the organisation's objectives.

3.4.3 Trustworthiness

Trustworthiness in qualitative research ensures the validity and reliability of the study. According to Bryman *et al.* (2021:62), it comprises four key components: credibility, transferability, dependability, and confirmability. Credibility involves verifying findings with participants to ensure accurate representation of their perspectives (Bryman *et al.*, 2021:62). Transferability refers to the applicability of findings to other contexts, achieved by providing detailed descriptions (Elo *et al.*, 2014:2). Dependability requires a consistent and systematic approach, with thorough documentation for transparency (Bryman *et al.*, 2021:63). Confirmability ensures objectivity, with findings shaped by participants responses rather than researcher bias (Bryman *et al.*, 2021:63).

The researcher ensures good practice and that all findings are credible and verified. A detailed description is provided, and a systematic approach was followed, as detailed by this study. The findings of this study are shaped by interviews with specific dairy organisations and professionals.

3.5 Ethical Consideration

All potential participants have received communication requesting an interview for this study. The initial communication was via email, which was standard for all potential participants and stated that no personal information would be shared. Participants were informed that the interview would be recorded and transcribed if they accepted. The accepted participants chose a time for the interview to ensure their availability. At the start of the interview, the participants were requested to confirm that they participated willingly. An example of the interview request can be observed in annexures B.

This study complies with the South African Protection of Personal Information Act (POPI). All personnel information will be sourced directly from potential participants and will only be used for this study. No personal information will be shared with third parties or published. No organisation name will be mentioned in the study and referred to as the organisation.

3.6 Study Population and Sampling

The population comprises professionals employed at one of South Africa's leading dairy producers. Table 4 shows the departments in which the participants work and their specific roles in the organisation.

Table 5: Participant department and role classification

Participant	Department	Role in the organisation
Participant 1	Industrial	Performance and Project Manager
Participant 2	Operations Logistic	Distribution Coordinator
Participant 3	Cycles and Procurement	Direct Spend Manager
Participant 4	Operations Logistic	Loss Control and Logistics Manager
Participant 5	Research and Innovation	Packaging Engineer
Participant 6	Operations Logistic	Logistics Project Manager

Non-probability sampling, specifically purposive sampling, was used. Bryman *et al.* (2021:224) stated that for purposive sampling, the researcher aims to sample participants strategically. This method helps ensure the sample will comprise possible participants with relevant skills and employment to the study.

All participants are in Gauteng and employed by one of South Africa's leading dairy consumer goods manufacturers. Interviews were conducted until saturation was achieved.

3.7 Data Analysis

The researcher conducted the interviews and transcribed and encoded the data using thematic analysis. Thematic analysis is used in qualitative research to analyse and identify themes in the data, as explained by Clarke and Braun (2015:1). Thematic analysis aims to identify important data elements, as stated by Clarke and Braun (2015:2). Atlast ti was used as a tool to do the analysis. This tool allows transcribed data to be uploaded, stored, ordered, and theme identification.

3.8 Conclusion

This chapter provided a comprehensive overview of the research methodology used in this study, focusing on developing and implementing green supply chain strategies by South African consumer goods manufacturers. The chapter began by detailing the empirical research, which involved semi-structured interviews with professionals from one of South Africa's leading dairy product producers. The research paradigm adopted was interpretivism, allowing an in-depth understanding of green supply chain management's motivations, strategies, and challenges. The research approach was qualitative, using an inductive method to gather and analyse data. The chapter also explained the design of the measurement instrument, which included the development of interview questions and the data collection process. Interviews were conducted online, recorded, and transcribed for analysis. The study's trustworthiness was ensured through credibility, transferability, dependability, and confirmability. Ethical considerations were also addressed, emphasising compliance with the South African Protection of Personal Information Act (POPI) and voluntary participation. The chapter concluded with an explanation of the data analysis process, employing thematic analysis to identify key themes and patterns in the data.

CHAPTER 4 RESULTS AND FINDINGS

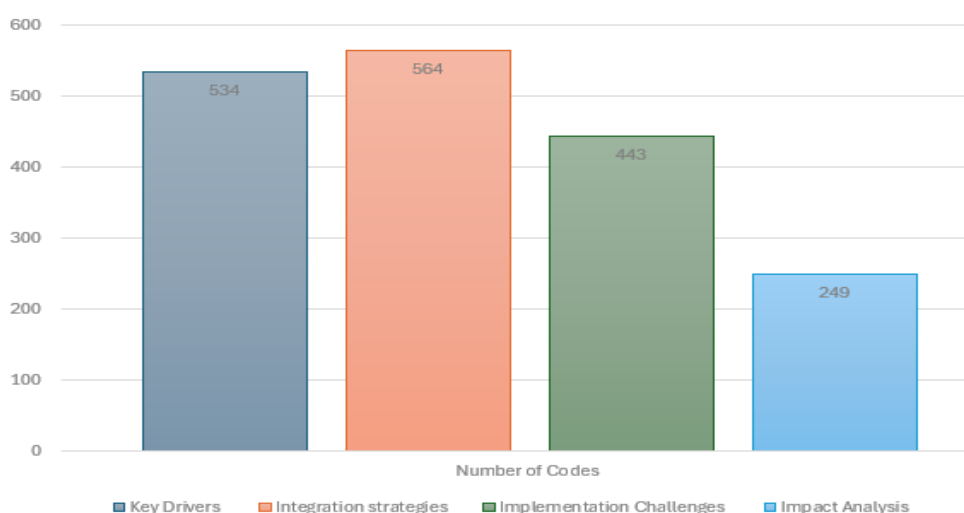
4.1 Introduction

The themes identified in this chapter can be defined as follows: Key drivers refer to the motivations for the organisation to implement green supply chain strategies, such as cost reduction, sustainability, ethical considerations, and regulatory compliance. Integration strategies focus on the supply chain operational functions implemented to reduce the organisation's environmental impact, including updated procedures, technology implementation, product design, data management, and reporting. The challenges the organisation faces when implementing green supply chain strategies are captured under the implementation challenge's theme, which includes issues like stakeholder alignment, lack of knowledge, initial investment, and cost management. Lastly, impact analyses refer to the impact of green supply chain strategies, such as cost efficiency, operational improvements, reputation enhancement, and CO² reduction.

4.2 Basic Data Coding

The Atlas.ti artificial intelligence function identified 1772 codes from the transcriptions. The program also identified four main themes. Similar codes were shared between all four themes. The identified themes and number of codes can be observed in Figure 6 with the number of codes.

Figure 6: Original number of themes and codes



The Atlas.ti code manager function was used to reduce the 1772 codes into 26 categories, as shown in Figure 7. This figure also represents the final themes and categories used for the rest of the analyses.

Figure 7: Final number of themes and categories

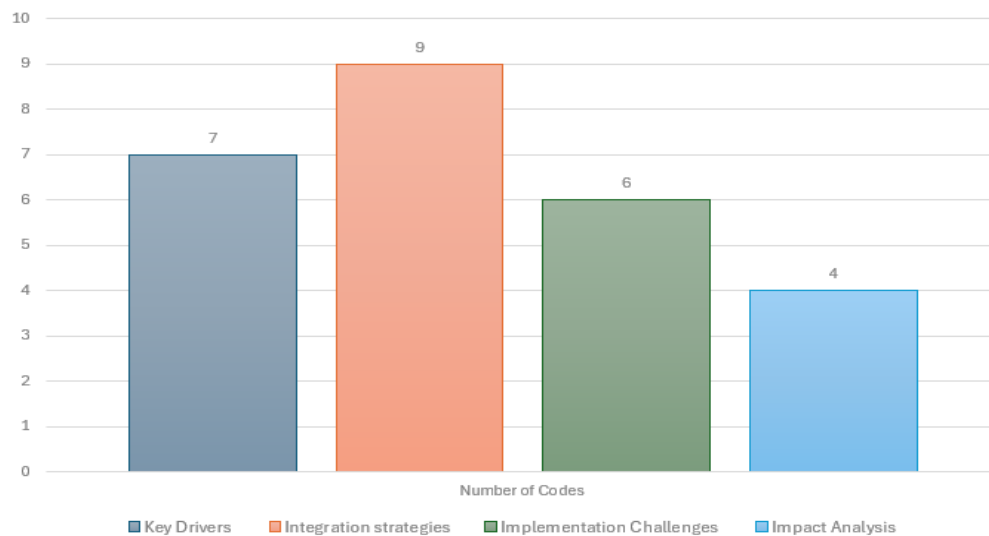


Table 5 highlights each theme in blue, followed by a detailed definition of the categories under each theme. The categories are unique to each theme. The table defines each category and demonstrates extracts from the participant transcription motivating the specific category and theme.

Table 6: The identified themes and categories

Theme 1: Key Driver	Description	Participant extract
Cost Reduction	The primary motivation for implementing green supply chain strategies is the cost-benefit these strategies have for operations.	Participant 1: "I think one interesting concept, and I've forgotten, and when we do a business case, even with normal projects, The organisation has a green payback. So, like any business case or when you're doing a project, you'll do a cost-benefit sort of analysis and get a payback period and a return on investment or net present value. We are looking at a few metrics."
Sustainability	This represents using resources responsibly, not wasting them and reserving them for future use.	Participant 2:" So, for me, the key driver for the implementation and development of a green supply chain would be sustainability. An organisation must have a mission to be sustainable. How sustainable is it going to be five to 10 years from now, 10 to 20 years from now for the next generation that they leave behind?"

Ethical Consideration	The organisation's motivations stem from corporate responsibility. Implementing green supply chain strategies motivates the organisation to act ethically and morally.	Participant 3: "Yeah. So, okay, I think at the organisation, we ensure all our supplies are registered on SEDEX, which is Supply Ethical Data Exchange. But it does not only look at the social aspects. It also looks at the environmental side of things to ensure that supplies adopt environmentally friendly practices in their production. As you have been to a few of our QBRs, our business reviews, and our supplies, they are required to share an update on their progress in sustainability. For example, what are the projects, timelines, resources, and challenges? They share this with us in all our business reviews, so that's one way we ensure that we also select supplies. When we do a supply selection, we evaluate."
C02 Reduction	Reducing carbon emissions is a critical motivator for implementing a strategy.	Participant 4: "But when we look at the organisation specifically, there is a target towards 2030 to reduce carbon emissions, to use bio fossils for packaging and so forth. So, it almost depends on where you are and the strategy of the company itself."
Environmental Regulations	This is an external motivator. It focuses on institutional pressure to implement less harmful practices to the environment.	Participant 4: "Well, from our perspective, well, so I know that in our instance, and I think it's most probably nationally, globally, et cetera, where it's normal pressure from the regulators, you know, like the government, et cetera. But from one of the perspectives, especially hence global, our global partner, the organisation (global office) overseas, is pressurising us for sustainability. And one of the other things is cost savings."
Return on Investment	The primary motivator for implementing green supply chain strategies is the return on investment the organisation can benefit from.	Participant 4: "You see, the thing comes in; you have to calculate your ROI, obviously. You understand? But I don't think, let's say now your return on investment is 10, 15 years."
Consumer Demand	This refers to consumer pressure motivating the organisation to implement green supply chain strategies.	Participant 3: "So it also shows to the consumers that this company does care for the environment. So, for sure, that is, you know, it will drive. It's a key driver for organisations to develop this strategy, knowledge and awareness as well."

Theme 2: Integration Strategy	Description	Participant extract
Delivery Process Optimisation	The process of delivering products and materials at a minimum cost and impact on the environment.	Participant 6: "So two items here, the transport and the warehouse, and what that means is that if we can ensure that we either deliver less frequently, let's say to the customer, okay, then we can ensure that we are making an impact in our CO ² emissions made by the vehicles. So that's one of the huge projects that I have been working on as well, where we are trying to make sure that other customers order all their goods on a single day, or if they can't, that we make sure that we are at least reducing the number of times that we deliver to that customer in a week. So, if we can't do one delivery day, then the max we now have is two, coming from three and four delivery days per week."
Energy Optimisation	Implementation of strategies to reduce or produce more sustainable energy for operation purposes.	Participant 1: "The CHP plant project, a big energy improvement and carbon emission reduction, took us about three years to get the contracts."
Research and Innovation	Redesign formulations, packaging, and secondary materials to have less of an impact on the environment.	Participant 2: How do we design packaging that is just designed to go from our factory to our customer? No further. So, by the time that thing gets to the customer, it still holds its form and shape, but it's all reusable or recyclable material. It's all paper."
Supplier Collaboration	Supplier selection and collaboration strategy to ensure materials used are ethically and sustainably sourced.	Participant 3: "It also looks at the environmental side of things to ensure that supplies adopt environmentally friendly practices in their production."
KPI Integration	This refers to the organisation's KPI integration strategy, "impact journey," which focuses on the environment, people, and health.	Participant 1: "And then, since then, now officially being moved into what we call the organisation Impact Journey, so CIJ. This is a set of frameworks or KPIs and targets from the organisation group where we need to meet some sustainability targets. There's sort of three pillars: there's environment, health, and then people."
Recyclability	A strategy that ensures materials used in organisations' products are recyclable.	Participant 5: "So essentially, there's a tool that the organisation used; it's designed for recyclability."

Plastic Reduction	This strategy focuses on reducing the amount of plastic used in packaging materials.	Participant 5: "For the bubbles project, we currently use high-packed sheeting, and then we're going to use foam sheeting. So, essentially, by moving to foam sheeting, we're going to use better plastics and get better yields from the supplier. So, in effect, we'll be using less plastics."
Reporting Tool	This is the system the organisation uses to report and interpret data regarding environmental impact.	Participant 1: "So, that's one of the examples of a project that's actually driven from the sustainability side. And in terms of reporting, we use a very comprehensive tool. It's called Green Track."
CO ² Impact Mapping	This strategy involves mapping CO ₂ 's impact to understand where the organisation can minimise its impact.	Participant 1: "And The organisation also included a green payback. So, basically, what that is, it puts a value, and I think it's 35 euros per ton, or I can't remember exactly, or per kg of carbon emissions into the savings. So, if you're saving carbon emissions, it actually gives you a further benefit in terms of this being a cost to the organisation."
Theme 3: Implementation Challenges	Description	Participant extract
Cost Management	This refers to the ongoing cost the organisation must ensure when implementing a green supply chain process.	Participant 1: " We're still very price-conscious. At the end of the day, the business needs to make money and price in the market is important and we can't add additional costs to the supply chain because we need to be able to be competitive in the market. So, I don't think we've made. We've done lots of projects, don't get me wrong."
Initial Investment	This is the high upfront investment an organisation must incur to implement a green supply chain process or strategy.	Participant 3: "Okay. I think the challenge would certainly be, from a cost point of view, that some of these green initiatives do require upfront investments. As you know, I mentioned the CHP, that alternate energy plant that costs huge."
Lack of Knowledge	The lack of understanding, skill and knowledge creates challenges when implementing green supply chain processes or strategies.	Participant 4: "Well, so the thing that comes in is, there is most probably a lack of expertise within knowledge within the country. Then, you also have these entities or parties that are resistant to change."

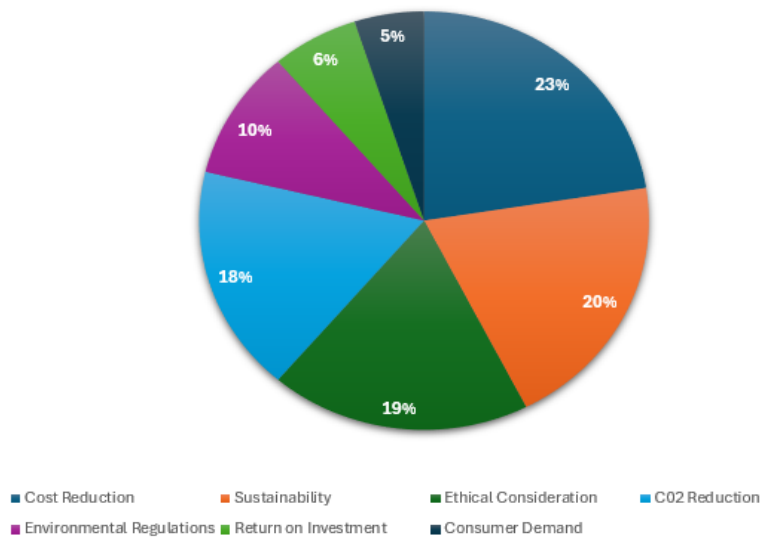
Stakeholder Alignment	Ensuring internal and external stakeholder buy-in when implementing green supply chain strategies or processes is challenging.	Participant 1: "Well, if it is more, you have to run through a lot more approvals, especially in a business environment in South Africa where it's quite tough and has low margins. It's definitely one thing that you struggle with. Stakeholders buy-in is also, so, luckily enough, we have quite a strong, I want to say, push from the leadership or the Exco in South Africa on the sustainability, you know, sort of roadmap and drive."
Theme 4: Impact Analysis	Description	Participant extract
C02 Impact Reduction	Green supply chain processes had a positive impact on C02 emissions.	Participant 1: "Coal-based electrical supplies that we can use natural gas outside to produce all our electrical energy, which is about a 50% carbon reduction in terms of factory emissions."
Cost Efficiency	Green supply chain processes had a cost-reduction effect.	Participant 2: "But green supply chain in the distribution sense and productivity, so cost saving, goes hand in hand."
Efficiency Improvements	Green supply chain processes have improved operational efficiencies.	Participant 6: "Then with efficiency. So, for us, those two also went hand in hand. Our idea with the projects that we have now done in the last, let's call it the end of 2023 and 2024, last year and a bit, was to ensure that our network is as efficient as possible. So, we saw at first hand that sustainability was directly linked to our efficiency."
Reputation Enhancement	Implementing green supply chain strategies positively impacted the organisation's reputation.	Participant 3: "So, yeah, I think that's that. Brand image also, you know, company culture example. When you adopt these green practises, it does look good for you as a company. It enhances your reputation. For example, Tetra Pak at the back there, you will see that recyclable logo. Even in our bottles and cups at the bottom, you will see recyclable."

4.3 Theme 1: Key Drivers for Green Supply Chain Implementation

Figure 8 illustrates the percentage weight of each category under the key driver theme. The top four categories comprise 79% of the key drivers identified by the participants. These categories are cost reduction (23%), sustainability (20%), ethical consideration (19%), and C0² reduction (10%). Cost reduction, sustainability and ethical consideration comprise 62% of the key drivers. Participant 3 explained that green initiatives are driven by the top management globally in this organisation. Furthermore, the participant referred to the organisation's impact journey. The impact journey is a strategic KPI integration strategy focused on three main concepts: people,

health, and the environment (Participant 1). This includes targets the organisation needs to achieve globally and locally (Participant 1).

Figure 8: Key Drivers of Green Supply Chain Strategies

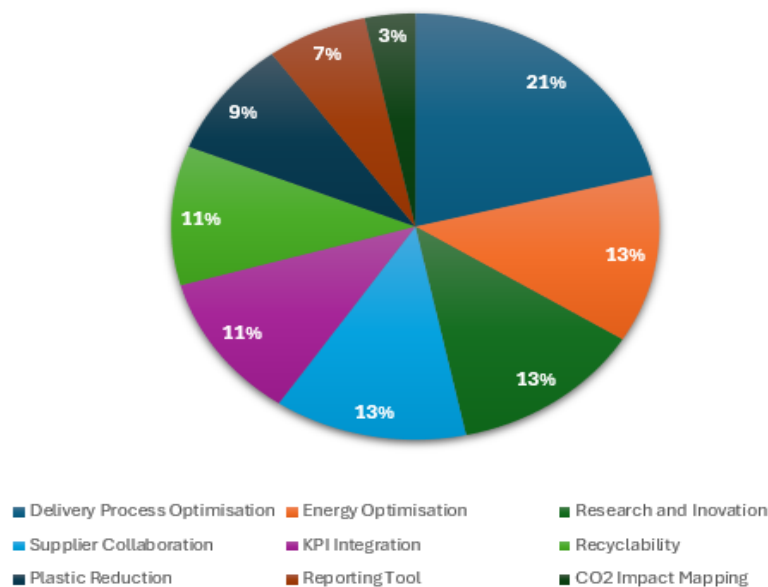


Even though the organisation's impact journey is an internal strategy motivated by responsibility and ethical points, cost remains the deciding factor. Participant 1 explained that sustainability is an important priority, but it still needs to make sense from a cost perspective. The participant explained that they have not done pure green projects. They have only done projects that make business sense regarding costs with a positive environmental impact.

4.4 Theme 2: Green Supply Chain Integration Strategies

Figure 9 illustrates the percentage weight of each category under the integration strategy theme. Delivery process optimisation carries the most significant weight at 21%. However, out of the nine integration strategies identified, the top six make up 81% of the total weight.

Figure 9: Green Supply Chain Integration Strategies



4.4.1 Delivery Process Optimisation

All participants referred to the organisation's delivery process optimisation strategy, which focuses on reducing carbon dioxide emissions in transport (Participant 6). This Strategy involves the following:

- Optimising delivery loads to the maximum capacity to reduce the number of loads delivered to clients weekly in the case of direct deliveries. This is done by prompting clients to order all they need on a single day. This increases order sizes and ensures full load utilisation and less frequent deliveries. Participant 6 stated that this reduced deliveries to individual clients from four to a maximum of two times a week.
- The second part of this strategy includes re-examining how the product is packed on pallets. This aims to ensure pallets are utilised to the fullest, increasing load utilisation. Participant 6 also focused on primary deliveries between the factory and the organisation's distribution centres. By optimising pallet utilisation, warehouse movements within distribution centres were decreased as more products could physically be moved from one point to another.

The above strategies have precise cost and efficiency benefits. Reducing the movements needed to supply consumers and optimising warehouse movements positively impact reducing in carbon emissions.

4.4.2 Energy Optimisation

The organisation has an energy initiative project focused on implementing a combined heat and power (CHP) plant (Participant 3). This plant will be implemented at the organisation's factory in South Africa and can generate electricity from various fuel sources (Participant 3). This will allow the organisation to use coal or natural gas to produce electricity. Participant 1 stated that the CHP project would lead to an estimated 50% carbon emission reduction at the organisation's factory. This also includes an ammonia compressor upgrade. This will allow for a more efficient cooling system in the factory using less electrical energy (Participant 1).

Participant 1 also explained that the next step after the CHP implementation in 2024 will be to look at a 100% biogas project. This will allow the factory to be a net zero production facility from an energy perspective and completely independent from ESCOM.

Participant 3 also pointed out that solar energy was installed for all the third-party warehousing. This is mainly due to the organisation operating in the dairy industry, which requires a warehouse temperature between two and seven degrees Celsius to ensure the cold chain. The solar project allowed efficient and cost-effective running of chillers to maintain the optimal temperature.

4.4.3 Research and Innovation

The organisation has a dedicated research and innovation team that focuses on launching new products. The team also focuses on redesigning packaging for cost reduction and the impact journey pillars (Health, People, and the environment). Participant 5 is part of this team and explained that the organisation has the tools to design more recyclable products. They pointed out a project called Bubbles. This project is currently moving from standard compact plastic sheets to foam sheeting. Participant 5 explained that this would lead to better yields from the supplier, reducing cost and plastic reduction, making it more environmentally friendly.

Participant 3 stated that organisations also focus on light-weighting as a material design strategy. This positively affects cost reduction and the environment as fewer harmful materials are used. Participant 5 gave a practical example of the organisation's project implementation to reduce the number of beards used in their secondary packaging. This has led to an initiative called one-way packaging, where the actual crates are not made from plastic but recyclable corrugated paper. It is designed to last just the time it takes to deliver the product to consumers and then start to deteriorate (Participant 2).

4.4.4 Supplier Collaboration

Participant 3 explained that all the organisation's suppliers must be registered on SEDEX. This global organisation specialises in data and services related to supply chain sustainability (SEDEX, 2024).

The procurement team conducts quarterly business reviews (QBR) with each supplier. One key aspect of a VAGA analysis is environmental considerations. Suppliers must present an update on environmental projects they must implement (Participant 3). The organisation itself is a member of Polyco; therefore, the organisation pays fees based on the number of plastic suppliers and the organisation's use (Participant 3). Polyco uses these fees for recycling projects, as mentioned by Participant 3. Supplier collaboration strategies are also closely linked to research and innovation. If the organisation redesigns a product or specific materials, the suppliers who supply the material must be reassessed regarding capability and cost.

4.4.5 KPI Integration

The KPI integration strategy focuses on the organisation's impact journey strategy. Participant 1 explained that the impact journey is a set of frameworks concentrating on three pillars: people, health, and the environment (Participant 1). Under the environmental pillar, a set of KPIs needs to be met. Participant 1 referred to the innovation map as part of the impact journey. This map includes sustainability factors that need to be tracked and reported on. The participant listed a few essential targets like responsible water usage, deforestation, and recyclability and that action plans are in place to tackle these problems locally.

Participant 3 stated that the impact journey is part of everyone's KPI in the organisation. This is how management on a local and global scale ensures total integration with the three pillars of the impact journey.

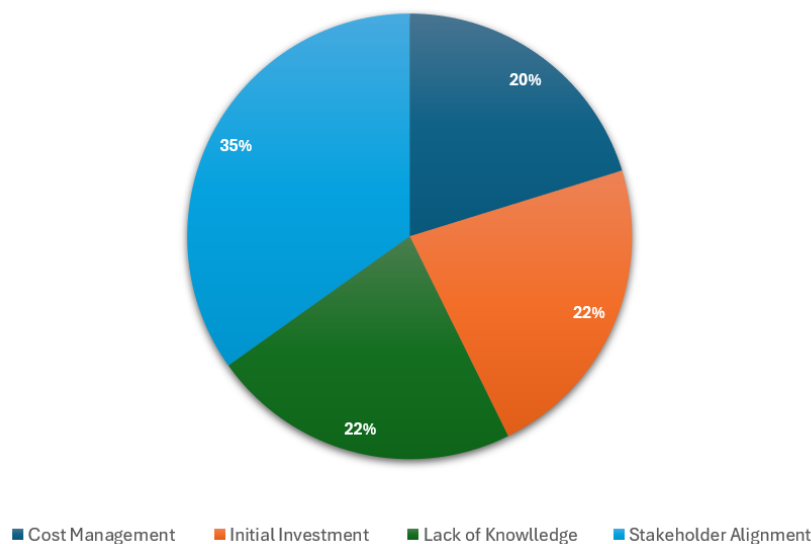
4.4.6 Recyclability

Under the research and innovation strategy, the organisation designs its products to be more recyclable. However, the organisation also plays a significant role in ensuring the materials it uses get recycled. Participant 3 explained that the organisation has initiatives at schools to collect empty packaging material. This material that would have been wasted is recycled and made into school desks for the children.

4.5 Theme3: Implementation Challenges

Figure 10 illustrates the percentage weight of each category under the implementation challenge theme. All four codes under this theme carry over 20% of the weight, with stakeholder alignment with the highest percentage of 33%.

Figure 10: Green Supply Chain Implementation Challenges



4.5.1 Stakeholder Alignment.

Stakeholder alignment regarding green supply chain initiatives is a significant roadblock for the organisation's employees. Participant 1 mentioned that, despite the known energy improvement and carbon emission reduction, it took three years to get the signoff and the contract in place for the CHP project.

Participant 3 pointed to the challenge of conflicting with KPIs regarding the impact journey strategy. It was explained that the procurement KPI is to source locally, but they also have a cost-saving KPI, and in some cases, it is significantly more cost-effective to import. If procurement chooses a supplier from abroad with longer lead times, the material planning team pushes back. They don't want to keep high buffers; their main KPIs are capital management and stock turnover. Participant 5 questioned if the organisation focused on sustainability, as most projects from the cycles and procurement department focus on cost initiatives.

Participant 4 alluded to the difficulty of aligning the clients with the new delivery strategy. The participant stated that, at first, the clients hesitated to take a maximum of two deliveries a week. After the trial period, it was easy to change order patterns as the clients started to see the benefits.

Participant 5 stated that they needed to run trials for some lightweight caps. This big plastic and cost initiative focuses on the organisation's multi-grain offering cap. However, due to the high volume of the product and the planning team needing the capacity to service the market, no time can be allocated for the trials.

4.5.2 Lack of Knowledge

Participant 4 identified the lack of expertise and knowledge in South Africa as the main challenge. There is still much to learn when designing products and packaging materials and discovering alternatives. Participant 5 explained that lightweight strategies can only reduce the amount of plastic used. The organisation is reducing the amount of plastic they use in their materials but cannot altogether remove it. This is because they have not found a solution to provide the same characteristics for the organisation's products.

4.5.3 Initial Investment.

Participant 2 explained that green supply chain initiatives can be expensive, regardless of the long-term operational cost savings. This is also supported by Participant 3, stating that green initiatives implementation comes with significant upfront investments. Participant 4 deep dive into the transport sector and electric vehicles. It was explained that there are currently 3500 hauliers actively operating in South Africa. Each haulier owns between 15 to 100 trucks. The participant stated it would take a significant investment to transition to electric vehicles in the country. The participant also explained that there is a lack of infrastructure within the country regarding electric charging stations and that this will not be viable currently.

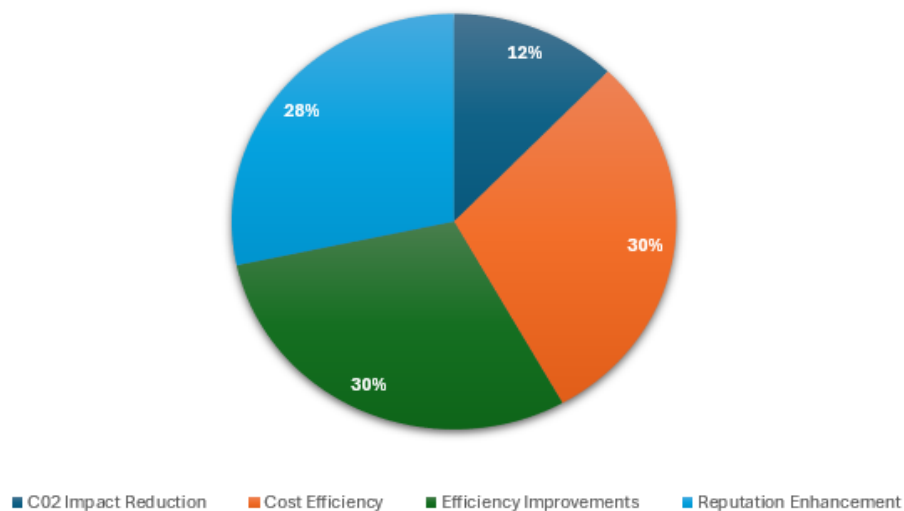
4.5.4 Cost Management

Participant 1 explained that organisations still need to make a profit and that the market price is essential to remain competitive. Therefore, initiatives can't add more cost to the supply chain. Participant 5 stated that a project from one of the organisation's suppliers is to supply a lighter cap. The challenge comes with the colour; most of the market only uses a white or black cup, but the organisation cap for this product and brand needs to be blue. Due to this requirement, the lightweight cap will be more expensive than the current cap.

4.6 Theme 4: Impact Analysis

Figure 11 illustrates the percentage weight of each category under the impact analysis theme. Cost efficiency and efficiency improvement came in equal at 30%. Reputation enhancement is 28%, and CO₂ reduction is 12%.

Figure 11: Green Supply Chain Impact Analysis



4.6.1 Cost Efficiency and Efficiency Improvements

Participant 1 started this conversation by noting that the organisation has never done a pure green project. The organisation does projects that make business sense and have a positive green impact. This was clear in the CHP implementation of the air coolers; these units use less energy and perform similarly. This had a long-term cost-saving and efficiency effect on the organisation's factory operations. The same is true for the goal and grass energy supply; the factory can generate its electricity at a reduced cost and is independent of Eskom.

Participant 4 explained that the delivery optimisation strategy to reduce loads and implement load and pallet optimisation saved the organisation money. The organisation uses fewer resources in its warehousing and delivery process, resulting in capital savings and higher efficiency. Project Bubbles reduced the amount of plastic used in packaging material, which also had a cost-benefit to procuring that material and providing the same characteristics (Participant 5).

4.6.2 Reputation Enhancement

Participant 3 stated that when an organisation adopts green practices, it looks good for the company. The recycle logo is on all the organisation's products, showing consumers that the organisation cares about the environment. Participant 3 also notes that it is essential to spread knowledge to be more environmentally friendly. This was the cornerstone for the organisation's school recycling initiatives, turning recycled packaging materials into desks. Participant 6 stated that this green initiative creates a ripple effect and that the organisation implements the impact

journey regardless of regulation requirements. The participants indicated that they are proud to be an organisation employee.

The primary drivers identified include cost reduction, sustainability, ethical considerations, and regulatory compliance. Cost reduction is a significant motivator, with the organisation prioritising projects that offer both environmental benefits and cost savings. This is evident in the emphasis on initiatives such as delivery process optimisation and energy optimisation, which reduce carbon emissions, operational efficiency, and costs. Sustainability and ethical considerations are also crucial, reflecting a growing corporate responsibility towards environmental considerations. Regulatory compliance further reinforces the need for green practices driven by local and global environmental regulations.

4.7 Conclusion

Chapter 4 presented a thorough analysis of the data collected during the study on green supply chain strategies among South African consumer goods manufacturers. This chapter identifies key themes such as drivers, integration strategies, implementation challenges, and impact analysis. The analysis revealed that cost reduction, sustainability, ethical considerations, and regulatory compliance are the primary motivations for adopting green supply chain practices. Integration strategies were highlighted as essential for reducing environmental impact, including delivery process optimisation, energy optimisation, research and innovation, supplier collaboration, KPI integration, and recyclability. The chapter also discussed the significant challenges faced during implementation, such as stakeholder alignment, lack of knowledge, initial investment, and cost management. Despite these challenges, the impact analysis demonstrated that green supply chain strategies lead to cost efficiency, operational improvements, reputation enhancement, and CO² reduction.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a comprehensive overview of the key insights and implications derived from the study on developing and implementing green supply chain strategies by South African consumer goods manufacturers. This chapter begins by summarising the main findings, highlighting the critical links between the motivations, strategies, challenges, and impacts identified in the previous chapters. It emphasises the importance of aligning environmental goals with business objectives and the need for continuous innovation and collaboration with suppliers to achieve sustainability targets. The chapter then discusses the study's limitations, acknowledging the constraints and challenges encountered during the research process, such as the geographical focus on South Africa and the limited sample size. Finally, it offers critical recommendations for future research and practical applications, emphasising the importance of integrating sustainability into corporate strategies to achieve long-term environmental and economic benefits. These recommendations include investigating corporate key performance indicators as a model for implementing green supply chain strategies, exploring cost-effective and environmentally friendly supply chain channels within South Africa's public transport infrastructure, and examining how small and medium-sized firms implement green supply chain strategies. The chapter concludes by reflecting on the study's contributions to the existing body of knowledge and its practical implications for South African consumer goods manufacturers.

5.2 Summary of the Findings and Key Links

The primary drivers identified include cost reduction, sustainability, ethical considerations, and regulatory compliance. Cost reduction is a significant motivator, with the organisation prioritising projects that offer both environmental benefits and cost savings. This is evident in the emphasis on initiatives such as delivery process optimisation and energy optimisation, which reduce carbon emissions, operational efficiency, and costs. Sustainability and ethical considerations are also crucial, reflecting a growing corporate responsibility towards environmental considerations. Regulatory compliance further reinforces the need for green practices driven by local and global environmental regulations.

The integration strategies for green supply chains include delivery process optimisation, energy optimisation, research and innovation, supplier collaboration, KPI integration, and recyclability. Delivery process optimisation involves reducing the number of trips and associated emissions by optimising delivery loads. For example, the organisation reduced deliveries to individual clients

from four to a maximum of two times a week. Energy optimisation includes implementing a combined heat and power (CHP) plant, which is expected to lead to a 50% reduction in carbon emissions at the factory. Research and innovation focus on redesigning packaging to reduce costs and environmental impact. For instance, the Bubbles project aims to reduce plastic usage by moving from standard compact plastic sheets to foam sheeting. Supplier collaboration ensures all suppliers are registered on SEDEX and adopt environmentally friendly practices. KPI integration involves the organisation's impact journey strategy, which focuses on three pillars: people, health, and the environment. Recyclability is another strategy, with the organisation designing its products to be more recyclable and implementing initiatives to collect and recycle packaging materials.

The implementation of green supply chain strategies also faces several challenges. Stakeholder alignment is a significant challenge, as it can be difficult to ensure buy-in from all stakeholders. For example, it took three years to get the signoff for the CHP project. There is also a lack of knowledge and expertise in South Africa regarding the design of products and packaging materials. Initial investment is another challenge, as green supply chain initiatives can be expensive and require significant upfront investments. Cost management is also crucial, as the organisation needs to remain competitive in the market and cannot add additional costs to the supply chain.

The impact analysis of green supply chain strategies shows they lead to cost efficiency and efficiency improvements, reputation enhancement, and CO² impact reduction. Green supply chain processes have resulted in cost savings and improved operational efficiencies. For example, the CHP implementation and air coolers use less energy and perform similarly, resulting in long-term cost savings. Implementing green supply chain strategies has also positively impacted the organisation's reputation, as the product recycle logo shows consumers that the organisation cares about the environment.

The findings from Chapter 4 highlight the key drivers, integration strategies, challenges, and impacts of implementing green supply chain strategies by South African consumer goods manufacturers. The cost reduction and sustainability drivers are closely linked to the delivery process optimisation and energy optimisation strategies, which aim to reduce costs and improve sustainability. The ethical consideration driver is linked to the supplier collaboration strategy, ensuring suppliers adopt environmentally friendly practices. The CO² reduction driver is linked to the energy optimisation strategy, which focuses on reducing carbon emissions through projects like the CHP plant. The stakeholder alignment challenge is linked to the KPI integration strategy, as conflicting KPIs can make it difficult to align stakeholders. The challenge of lack of knowledge

is linked to research and innovation strategy, as there is still much to learn about designing more sustainable products and packaging materials. The initial investment and cost management challenges are linked to the impact of cost efficiency and efficiency improvements, as green supply chain initiatives require significant upfront investments but can lead to long-term cost savings.

5.3 The Objectives of the Study

The study's primary objective was to explore how consumer goods manufacturers implement green supply chain strategies and what impact and barriers firms will face in South Africa. This was achieved through a comprehensive investigation that examined internal strategies, identified barriers, and understood the motivations behind these implementations.

To investigate what internal strategies are implemented to promote a green supply chain, the study utilised semi-structured interviews with professionals from a leading South African dairy product producer. Thematic analysis was employed to identify key themes and patterns in the data. The findings revealed that cost reduction, sustainability, ethical considerations, and regulatory compliance were the main drivers for implementing green practices. Integration strategies such as delivery process optimisation, energy optimisation, and supplier collaboration were identified as crucial for achieving sustainability goals.

The study also aimed to identify barriers to implementing a green supply chain for a South African consumer goods supplier. The research highlighted several challenges, including stakeholder alignment, lack of knowledge, initial investment, and cost management. Despite these challenges, the impact analysis showed that green supply chain strategies led to cost efficiency, operational improvements, reputation enhancement, and CO² reduction.

To identify green supply chain practices unique to South Africa, the study provided valuable insights into the best practices, opportunities, and barriers South African consumer goods manufacturers face. The research emphasised the importance of aligning environmental goals with business objectives and the need for continuous innovation and collaboration with suppliers to achieve sustainability targets. Finally, the study aimed to identify the primary motivation for implementing green supply chain practices. The findings indicated that cost reduction and sustainability were the most significant motivators, followed by ethical considerations and regulatory compliance.

The study successfully achieved its objectives by comprehensively understanding how South African consumer goods manufacturers develop and implement green supply chain strategies.

The research methodology, including qualitative interviews and thematic analysis, allowed for an in-depth exploration of green supply chain management's key drivers, strategies, challenges, and impacts.

5.4 Recommendation for Future Research.

The study successfully addressed the primary research question by investigating how South African consumer goods manufacturers develop and implement green supply chain strategies. The study identified key motivations, strategies, and challenges associated with green supply chain management through a literature review and empirical research. The findings revealed that cost reduction, sustainability, ethical considerations, and regulatory compliance are the main drivers for implementing green practices. The study also highlighted various integration strategies contributing to achieving sustainability goals, such as delivery process optimisation, energy optimisation, and supplier collaboration. By examining these aspects, the research provided valuable insights into the practical application of green supply chain strategies in South Africa. It was also noted that the organisation had a broad green supply chain strategy with integrated KPIs on every level of operation. Based on the above, the following are recommendations for further studies:

- South Africa is home to an extensive FMCG industry; conducting a qualitative investigation on multiple firms to understand the country's most effective green supply chain strategies in terms of environmental impact and cost saving.
- An investigation on how corporate key performance indicators can be used as a model to implement green supply chain strategies.
- Exploring South Africa's public transport infrastructure to identify supply chain transport channels that are more cost-effective and environmentally friendly.
- An investigation into how small and medium-sized firms implement green supply chain strategies.

The above recommendations will add to the existing body of knowledge. This study has provided valuable insights into South African consumer goods manufacturers' development and implementation of green supply chain strategies. The research identified key motivations, strategies, challenges, and impacts of implementing a green supply chain in South Africa.

5.5 Limitations of the Study

The geographical demarcation will be the main limitation. This study only focuses on supply chain professionals within one of South Africa's most prominent dairy manufacturing producers. The

type of sampling used, non-probability sampling, is also a limitation. Non-propensity sampling is simple to apply and affordable for this study.

Only six professionals participated; the interviews were conducted in the third quarter of 2024. The organisation experienced peak volume during this period, and potential participants were unavailable. The participants were spread over multiple functions and departments, and saturation was achieved.

5.6 Closing Remarks

In conclusion, this study has provided a comprehensive examination of South African consumer goods manufacturers' development and implementation of green supply chain strategies. The research has highlighted these initiatives' critical motivations, strategies, challenges and impact.

The findings also correspond with the existing literature regarding motivation and challenges. The existing literature identifies the delivery optimisation strategy as an example of green transportation. The combined heat and power plant (CHP) is something unique. The literature was limited regarding manufacturing sites generating electricity as a green supply chain strategy. The organisation's energy system allows for multiple sources of electricity controlled on the manufacturing site. This granted the organisation independence from South Africa's main energy supplier, Eskom. This has significantly reduced carbon emissions and is critical for the organisation's factory to become a net zero production facility.

In summary, this study has significantly contributed to understanding green supply chain management in the South African context. It has explored green supply chain practices' motivations, strategies, challenges, and impacts. The findings underscore the importance of aligning environmental goals with business objectives and the need for continuous innovation and collaboration to achieve sustainability targets. As organisations continue to navigate the complexities of green supply chain management, the insights from this study will serve as a valuable resource for guiding their efforts towards a more sustainable future.

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ANNEXURE A: INTERVIEW QUESTIONS

Good day

My name is Dewalt, and I am currently doing a qualitative study on how green supply chain strategies are developed and implemented in the fast-moving consumer goods industry. Your participation in this interview is greatly appreciated.

Ethical Check

- Will you acknowledge by saying yes or no that you participated willingly in this study?
- 1. What do you think is the key drivers for organisations to develop and implement green supply chain strategies.
- 2. What does your organisation do to integrate environmental consideration into its supply chain.
- 3. What would you say is the main challenges when implementing green strategies, and how can we overcome it.
- 4. What impact has the implementation of green supply chain strategies have in terms of cost, efficiency, and reputation?

Thank you so much for your time, and I hope you enjoyed the discussion.

Supervisor: Nelda Mouton

Student: Dewalt Britz

Student number: 28502428

ANNEXURE B: INTERVIEW REQUEST

Hi [REDACTED]

I hope you are well.

I want to request an interview with you regarding green supply chain management. Your insights and experience in supply chain and logistics will be extremely valuable to my study. I have attached the questions for you to reflect on before the interview. I have also provided background information on green supply chain management.

However, my focus in the interview will be on you and [REDACTED]. I aim to understand your perspective and what you do within your role regarding the green supply chain.

If you accept, the interview will be on teams at a time that suits you. I will have to record it for transcription purposes, and the video should be on.

It is important to note that even though my focus is on [REDACTED] as an FMCG, the company or your own name will not be mentioned in the study. You will be referred to as a participant, and [REDACTED] will be referred to as a well-known organisation in the industry. The information will only be used for my mini-thesis in completing an MBA.

I would greatly appreciate your acceptance. Please let me know if you accept and, if so, what time would work best for you.

Thank You.
Dewalt Britz

ANNEXURE C: TRANSCRIPTION OF PARTICIPANT ONE

Researcher:

See, that's why my for once is done. Participant 1, really, thank you so much for your time. I really do appreciate it.

Just for some ethical formalities. Nobody forced you doing this interview willingly.

Participant 1:

Yeah, that's correct.

Researcher:

Thanks, Meneer. Will you just give me some info about your background, what you do for the organisation, and then what your educational background is as well. Sure.

Participant 1:

So, I'm a qualified chemical engineer, studied at TUCKs and after that, I went into FMCG. So, my career has been in engineering.

I've done various roles in supply chain at both Unilever, PepsiCo and now the organisation. Since I've been at the organisation for the last three years, I've worked on projects, project management, process manager, as well as sustainability and energy optimisation. So, the first thing I did when I came to the organisation was actually developed an energy roadmap as part of one of our strategic goals.

And then, since then, now officially being moved into what we call the organisation Impact Journey, so IJ. And this is a set of framework or basically KPIs and targets from the organisation group where we need to meet some sustainability targets. There's sort of three pillars, there's environment, health, and then people and I'm meeting the environment for sub-Saharan Africa. So, that is both South Africa as well as Nigeria, Ghana, and a few of the West African countries. So, that's my current role.

I also still manage projects for South Africa. And these projects range from anything from packing machinery to process plant to utilities. Probably the biggest projects in utility space being around the sustainability, energy optimisation.

So, I've been very involved in that journey with the organisation since I've been here. Yeah.

Researcher:

Pretty cool. I knew you, obviously, you were an engineer and you've been part of projects, but the organisation Impact Journey part I actually didn't know at all. So, I'm going to get some good information, you say, out of this interview.

ANNEXURE D: TRANSCRIPTION OF PARTICIPANT TWO

Researcher:

Ask the same questions I told you I'd ask in the email presentation. So, Participant Two, as you know, this is about green supply chain management, but it's more about you, what you think about it, what you do, and the Danone about it. It's not something you have to stress about; you have to have deep knowledge.

I want to try and understand what we actually do as a company. And it's for my study in my MBA for my mini dissertation. So, as well, you will be a participant in the study, but the non and your name will not be mentioned.

None of your personal details will be mentioned or the company's personal details will be mentioned. So I'm just letting you know about that. And then just an ethical check.

You are doing this willingly. And I'm not your manager or something forcing you into doing this interview. Cool.

Participant Two:

Yeah, 100%.

Researcher:

Okay, cool meneer. I'm going to ask you the first question.

What do you think is the key drivers for organisation to develop and implement green supply chain strategies?

Participant Two:

So, for me, the key driver for the implementation and development of green supply chain would be sustainability. An organisation must have a mission to be sustainable. How sustainable is it going to be five to 10 years from now, 10 to 20 years from now for the next generation that they leave behind?

So that's the main drive, I believe, necessary for one to start implementing green supply chain. And then obviously, you can start strategizing on how you're going to go about creating that sustainability. So, we know that there's certain elements to delivering services, goods and services to consumers that is hazardous or that comes at a cost that is hazardous, such as carbon emission, carbon footprint, pollution, waste.

So, for one to sort, one of the key drivers that one needs to have is a lookout or standpoint from a sustainability perspective. How sustainable do we want to be in the future? And do we still want a world that is sustainable, if I could put it that way?

Yeah, ek is nie seker (*he spoke in Afrikaans*), I'm not sure if I'm coming across the way you expected, but one needs to have that in mind is that we need to be sustainable. And that to the environment, because we want to leave a future to our kids and their kids and generations

ANNEXURE E: TRANSCRIPTION OF PARTICIPANT THREE

Researcher:

There we go. Participant 3, thank you so much for your time. I really do appreciate it.

This is for my NWU study for my MBA. I'm doing a study in green supply chain management, as you know, how The organisation implements it, and what your role is in the grand scheme of green supply chain management. This is more about you, what you do.

So please don't feel any pressure. Answer the questions freely. Will you just acknowledge by saying yes that nobody forced you into this interview that you're doing this willingly?

Participant 3:

Yes, I'm doing this interview willingly.

Researcher:

Thank goodness. No, I'm joking. So I'm going to jump right into it.

The first question I want to dive into with you is what do you think is the key drivers for organisation to implement green strategies in their supply chain?

Participant 3:

Okay. So I think that generally I would say, and especially think of The organisation as well, you need to have ex-co, co-de, basically leadership commitment because if we don't have top management commitment, then it's going to be very difficult to actually implement anything because obviously this comes at a cost. And when managers and executives then fully support these green initiatives, it's definitely easier then to create and to actually, yeah, you know, have this approach to sustainability, run the projects and so on.

It needs to be part of everyone's KPI, which as you know, currently it is in The organisation. You know the The organisation impact journey. It's probably in yours.

It's in myne. So the DIJ is now in everyone's KPI. So that shows, you know, top management commitment.

And for The organisation, it's not just like South African ex-co, but also it's a global initiative. So that's for me, the leadership commitment. That's where the buck, you know, stops there.

Then also what drives, I would say, you know, procurement, also cost reduction. The organisation campaign of local sourcing, for example, to reduce the CO2 footprint. Currently 80% of rows and tacks and milk is locally sourced.

Also it's part of this green supply chains, light weighting of packaging, light weighting bottles, corrugates, et cetera. So when you reduce costs in these ways, you're also contributing to the economy, well, the environment, you know, sustainability, et cetera. Reducing, for example, starch, which is imported and increasing another ingredient that is local, that too contributes.

So, yeah, I think that's that. Brand image also, you know, company culture example. When you adopt these green practises, it does look good for you as a company.

ANNEXURE F: TRANSCRIPTION OF PARTICIPANT FOUR

Researcher:

I'm not in a position of power to force you to interview or anything like that.

Participant 4:

Yes, I'm doing it willingly.

Researcher:

Okay, 100%.

Well, then I'm going to jump to the first question. What do you think is the key drivers for an the organisation to develop and implement green supply chain strategies or green initiatives?

Participant 4:

Well, from our perspective, well, so I know that in our instance, and I think it's most probably nationally, globally, et cetera, where it's normally pressure from the regulators, you know, like the government, et cetera. But from one of the perspectives, especially hence global, our global partner, the organisation (*global office*) overseas, is actually pressurising us for sustainability. And one of the other things as well is in terms of cost savings.

So those are the two key drivers from our perspective for sustainability to implement sustainability, especially on cost savings.

Researcher:

Okay. Yeah, I had a very good interview on the cost savings part of it with one of your counterparts. She gave me amazing information on it, specifically the project she was busy with at the moment.

Participant 4:

Yes, yes.

Researcher:

Okay. So I'm going to go to the second question. What does your organisation, the organisation specifically, do to your knowledge to integrate environmental consideration into their supply chain?

Participant 4:

ANNEXURE G: TRANSCRIPTION OF PARTICIPANT FIVE

Researcher:

for making time for this, especially the time that you've now made, you know, it's extra, it's not in work hours, I really do appreciate it. I'm going to ask you just an ethical check question, you know I'm doing a study on green supply chain management, I'm going to ask specific questions around it that I've shared with you and I want you to give me what the organisation is doing, what you are doing, what your experience is in the company, how the company is taking it on and I just want to ask you and you can say by yes or no, nobody forced you to do this, you're doing this willingly.

Participant 5:

Yes.

Researcher:

Thank you, participant 5.

Okay, are you ready to start?

Participant 5:

Yes, we can.

Researcher:

Okay, so the first question is, what do you think is the key driver for organisation to develop and implement a green supply chain or green strategies?

Participant 5:

Please repeat the question.

Researcher:

So the question is, what do you think is the key drivers for organisation, the main reason why organisation would implement green supply chain strategies or green initiatives? And what do you think is the main motivation behind it?

Participant 5:

I think, let me just put South Africa for an example. So I think in South Africa, what's happening is that we're having a lot of climate change issues and government now is forcing companies to kind of look at green supply strategies. Whereas in like multinationals, which we

ANNEXURE H: TRANSCRIPTION OF PARTICIPANT SIX

Researcher:

In supply chain management and how companies like the organisation implements it and how the people of the company actually do it. So it's more about you, what you do in your role and what the organisation does as a whole. So I'm just going to do one ethical check.

Nobody forced you to do this. Nobody. I'm not in a higher role than you.

You are doing this willingly.

Participant 6:

Correct.

Researcher:

Awesome.

Great. I'm going to jump into the first question. The first question is, what do you think is the key drivers, the main motivation for organisations to implement green supply chain strategies?

Participant 6:

I think we all have a bit of a responsibility towards our environment and what we need to do to kind of keep it. I'm going to call it clean, but you know what I mean, like keep it not just physically clean, but also in terms of what we're emitting into the air and so on. I think so it's that human aspect that I think is one of the drivers.

Another one that I think is in terms of big, large organisations and so on, that's another item is I know, for example, it might not be as big in South Africa, but I know in other countries, like some of the European countries and so on, they do get fined for what they are emitting into the air. So there's definitely a financial impact and a monetary type of motivator to assist in keeping our world healthy and green. So I think those are probably the two main ones.

Researcher:

I fully agree with you. You're the first interviewee that actually, all of the interviews I had, I had a few already, mentioned one of the two, but you're the first one that mentions both, that there's a regulation around it, that's a motivation, and then obviously the corporate responsibility side of things that we want to do. So yeah, 100% I agree fully with you.

ANNEXURE I: LANGUAGE EDITING CERTIFICATE



Dynamic Language &
Translation Specialists

Antoinette Bisschoff
71 Esselen Street,
Potchefstroom
Tel: 018 293 3046
Cell: 082 878 5183
Language@dlts.co.za
CC No: 1995/017794/23

Wednesday, 13 November 2024

To whom it may concern

Re: Confirmation of language edit, typography and technical precision

The MBA mini-dissertation "Investigating the Development and Implementation of Green Supply Chain Strategies by South African Consumer Goods Manufacturers" by **Dewalt Britz** (28507428) was edited for language and technical precision. Direct interview participant quotations were spell-checked. The quotations' grammar was not corrected to retain authenticity. Referencing and sources were checked to comply with the Harvard guidelines specified by the 2020 NWU Reference Guide.

Final, last-minute corrections remain the responsibility of the author.

Antoinette Bisschoff

BA Languages (UPE – now NMU); MBA (PU for CHE – now NWU); Translation and Linguistic Studies (NWU)

Officially approved language editor of the NWU since 1998
Member of SA Translators Institute (no. 100181)

Precision ... to the last letter

ANNEXURE J: TURNITIN REPORT



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3.2 Research Paradigm

Saunders et al. (2009:118) defined a paradigm as a way of examining social phenomena. Various research paradigms exist, but this study will focus on positivism and interpretivism.

Bryman et al. (2021:31) explained that the positivism paradigm requires the researcher to use natural science methods to explain social reality. Saunders et al. (2009:119) stated that the Interpretivism paradigm is subjective; the focus is on the reality behind the details.

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Due to the nature of this study's primary and secondary objectives, which are to understand how and why the topic is being implemented, an Interpretivism paradigm will be adopted.

3.3 Research Approach

This study has adopted an Interpretivism paradigm. Therefore, an Inductive research approach has been followed. Qualitative research has been conducted. Chapter two has identified known motivations, strategies, challenges, and effects of green supply chain integration. Semi-structured interviews with one of South Africa's leading dairy product producers' employees have been conducted to identify what they do regarding green supply chain management and practices. This study is cross-sectional, as the investigation will have been done over a single period.

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3.3.1 Designing the Measurement Instrument

Bryman et al. (2021:268) stated that interviews and focus groups are standard methods to use for research. This study will sample raw data directly from willing participants. Semi-structured interviews are used as a measuring tool for this study. This allows the researcher to cover a range of topics, as stated by Bryman et al. (2021:270)

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According to Bryman et al. (2021:270), the interviewer uses prepared questions from the interview schedule in a semi-structured interview. However, the interviewer can ask follow-up questions, which vary from the schedule.

3.3.2 Data Collection

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One-on-one interviews were conducted with manufacturing, product development, and supply chain professionals. Interviews were conducted online via Teams, and participants were

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contacted by email to arrange the interview based on their available time. The average duration of the interviews was 24.4 minutes. Background information about the study was provided on the interview request. All participants gave permission to record the interview, and they were reminded that participation is optional.

Commented [206]: You have left out how you check in qualitative for trustworthiness and validity. You also left out a section on ethics. Remember People Act very important, has to be included.

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ANNEXURE K: ARTIFICIAL INTELLIGENCE SIMILARITY REPORT

DEWALT BRITZ

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