Gordon Institute of Business Science
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The role of supply chain collaboration in driving the transition to a circular economy and its contribution to sustainable development outcomes

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ABSTRACT

The circular economy is gaining a lot of interest as an alternative system that could address global challenges of environmental degradation and the depletion of the Earth's resources. Business leaders are aware of the opportunities presented by the circular economy to gain competitive advantage whilst being responsible corporate citizens. The fast-moving consumer goods, packaging, mining, and heavy industry sectors are representative of the growing consumption patterns driven by population growth and urbanisation and the unsustainable negative impacts of the linear 'take, make, use and dispose' system. A transition to a circular economy in these sectors could have the biggest impact on the global economy, society, and the environment. This study aimed to develop new insights and understanding of supply chain collaboration for the transition to a circular economy. A better grasp of supply chain collaboration would better equip business leaders to make the necessary paradigm shifts to dramatically transform how their companies create, capture and deliver their value proposition to their customers, as demanded by the circular economy business models. This study investigated the major constructs of supply chain collaboration such as partner section, partner capabilities and the management of collaborative relationships. The enablers and barriers to transitioning as well as how the circular economy contributed to sustainable development outcomes were also investigated.

The research was designed as an exploratory, qualitative research. Data gathering was done through 18 semi-structured interviews of decision makers involved in circular economy and supply chain collaborations in the FMCG, Packaging, Mining and Heavy Industry sectors in South Africa and parts of Africa. The output of the study was a conceptual framework presenting the new insights on the key constructs of supply chain collaboration for a circular economy. This study served to confirm and thus add to the existing body of knowledge by making a potential contribution to the circular economy literature. The research also contributed potential refinements to the CE literature. These potential refinements to the CE literature included *supplier development incentives* and *financial capability* (related to collaborations)*; lack of institutional coordination*, *economies of scale*, *global frameworks,* and *consumer advocacy* (related to the barriers and enablers of the transition); and lastly, *country and sector context* related to sustainable development outcomes. The research also identified new insights that are potential extensions to the CE literature, related to supply chain collaborations for a circular economy. These potential extensions to the CE literature included *partner due diligence* and *partner support*.

Key Words:

Circular economy

Circular business models

Sustainability

Supply chain collaboration

Sustainable development outcomes

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Philosophy in Corporate Strategy at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Nokhwezi S. Nhassengo **28 November 2022**

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LIST OF ABBREVIATIONS AND ACRONYMS

BBBEE	Broad Based Black Economic Empowerment
BEE	Black Economic Empowerment
CBM	Circular Business Model
CE	Circular Economy
CEBM	Circular Economy Business Model
CLSC	Closed Loop Supply Chain
CSC	Circular Supply Chain
ED	Enterprise Development
EMF	Ellen MacArthur Foundation
FMCG	Fast Moving Consumer Goods
GSCM	Green Supply Chain Management
OLSC	Open Loop Supply Chain
SBM	Sustainable Business Model
SDGs	Sustainable Development Goals
SED	Supplier and Enterprise Development
SME	Small and Medium Enterprise
SSCM	Sustainable Supply Chain Management
UN	United Nations
UNEP	United Nations Environmental Program
WEF	World Economic Forum
YSIP	Young SDG Innovators Program

1. CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM

1.1 Background to the Research Problem

In its 17th report, the World Economic Forum (WEF, 2022a), identified climate action failure to be the most potentially destructive global risk, considering the aggravating effects it has on other global challenges. The root causes of climate change are said to be human actions which damage ecosystems and are now manifesting in extreme weather conditions (WEF, 2022a). In April 2022, hundreds of lives were lost, and billions of rands of infrastructure was damaged in KwaZulu Natal South Africa, in the country's deadliest floods since 1987 (WEF, 2022b). The effects of the existing economic system, which is resource intensive and generates a lot of waste and greenhouse gas emissions, are now being experienced directly through these extreme weather events, which are disruptive to economies and livelihoods.

The Ellen MacArthur Foundation (EMF, n.d.) promotes the circular economy (CE) as an alternative that could alter the global consumption patterns with far-reaching benefits for economies, industries, and global issues such as climate change. UNEA 4. Resolution 1 (UNEP/EA.4/Res.1) identified a circular economy as an ideal foundation for future development as it is designed to conserve the Earth's resources (United Nations Environment Program [UNEP], n.d.).

According to the WEF Circularity Gap Report of 2021 (WEF, 2021a), only 8.6% of the world's economy has converted to circularity. The report estimates that to prevent climate failure, the circularity of the global economy must expand two-fold (in addition to other climate action initiatives). Further, WEF (2021b) warned that because of population growth, urbanisation and growing human needs, global consumption had doubled since the 1970's and was expected to grow another 70% by 2050 if nothing was done to change the current patterns. That implies that the world would require 1.5 times the Earth's resources to support human needs (UNEP, 2021). This highlights the pressing requirement for business to embrace circular economy principles, to design waste out and minimise resource utilisation.

Moving to a circular economy presents many opportunities for businesses to gain competitive advantage (UNEP, 2021). UNEP (2021) further stated that in future, superior business performance will be by those with an ability to create value through less resources, minimal environmental impact and a consideration for society and the planet. This call for business to take the lead in the transition is further supported by the Business

Roundtable (2019) where top CEO's stated the purpose of business was beyond financial performance and that corporates should aim to serve all stakeholder needs, overturning their previous one-dimensional measure of business performance.

Despite the compelling case for businesses to transition to a circular economy, Woolven (2021) acknowledged there were some challenges for businesses in transforming their business models. The first challenge was the innovation required to design waste out, and secondly, collaboration and purpose alignment with partners in the value chain was vital. The lack of knowledge in navigating these challenges was a deterrent for firms that were interested in transforming their business models to circular (Woolven, 2021).

An opportunity exists for South Africa to leverage its youth population in taking advantage of the opportunities created by a circular economy. According to Population Pyramid (2019), of the 58.6 million people residing in South Africa, 34.9% are youth between the ages of 15-34 years. Statistics South Africa (2022) reported that in the first quarter of 2022, the highest unemployment rates were youth aged 15-24 years at 63.9% unemployment and youth aged 25-34 years recorded 42,1% unemployment rate, an estimated 10 million unemployed youth. The EMF Africa Policy Report (EMF, 2021) asserts that the circular economy can support economic development, generate employment opportunities and advance the Sustainable Development Goals (SDGs) objectives.

1.2 Research Problem

The research problem is situated in the circular economy as evidenced by the current debates in extant CE literature. The concept of circular economy (CE) has become increasingly popular in academia, government, society, and the business community (Berardi & de Brito, 2021; Ferasso et al., 2020; Geissdoerfer et al., 2017). Several studies had focused on clarifying the distinction of terms used to refer to the circular economy (Geissdoerfer et al., 2017; Geissdoerfer et al., 2018; Kirchherr et al., 2017; Korhonen et al., 2018). The concern was that a lack of coherence in the definition limited the contribution to the field and could result in the abandonment of the concept (Korhonen et al., 2018). Kirchherr et al. (2017), also found that most scholars, in their definition of the CE, had focused on the economic and environmental imperatives of the CE, whilst ignoring the social impact and consideration of future generations. This had influence on implementation in that the social outcomes were often neglected (Kirchherr et al. (2017).

Transitioning towards a circular economy (CE) inherently involves collaboration with entities external to the organization for mutual benefit. This form of collaboration is across sectors with other entities in the product value chain. Berardi and de Brito (2021) contended that there was a need for in-depth investigation into collaboration in supply chains to better understand how it facilitates the evolution of the circular economy and its contribution to sustainable development. This research was theoretically relevant as it sought to address the research questions recommended by Berardi and de Brito (2021) in their suggestions for future research. Berardi and de Brito's (2021) initial findings suggested that the alignment of interests influenced information exchange which played a role in the success of collaborative relationships, through innovation outcomes. Hina et al. (2022) found that organisations had a characteristic resistance to sharing information and called for research into what strategies or mechanisms could be utilised to encourage information sharing in collaborations for a CE.

1.2.1 Supply Chain Collaboration for a CE

CE literature revealed the role of supply chain collaborations in the transition to a CE as vital, with some scholars restricting this to specific CBMs, however the effect on the economic viability was acknowledged. Jager and Piscicelli (2021) and Vermunt et al. (2019) highlighted considerations about the type of CBM being implemented were key to navigating the supply chain collaborations when it came to CE implementation. They argued that the CBM determined whether or not supply chain collaborations were necessary. In addition, the type of challenges that could be encountered in CE implementation were specific to the CBM. According to Hina et al. (2022), the CE literature indicated that the level of collaboration in a supply chain had an impact on the successful implementation of a CBM. However, relevance of the type of CBM had not been considered in these studies. Nevertheless, Jager and Piscicelli (2021) proffered an important argument, that if incorporated, the supply chain collaboration played a significant role, which was to enhance the economic viability in all circular models. These contrasting and sometimes overlapping perspectives pointed to the importance of gaining further insights into the role of supply chain collaboration in the transition to a CE.

1.2.2 Partner Selection and Capabilities

The CE literature indicated innovation and complementary capabilities as a key in partner selection, which indicated a need to understand deeper the process of partner selection and the criteria. Berardi and de Brito (2021), Jager and Pisciceli (2021) and Veleva and Bodkin

(2018) all agreed on the notion of innovation contributing to the success of the supply chain collaboration. However, these scholars differed on whether the innovation capability ought to be a prerequisite (Berardi & de Brito, 2021; Jager & Pisciceli, 2021), or it could be enabled through the collaboration relationship (Veleva & Bodkin, 2018). Berardi an de Brito (2021) further highlighted the partner's ability to share knowledge was considered a critical success factor to consider in selecting partners. Jager and Pisciceli (2021) emphasised that the evaluation of the context prior to embarking on partner selection informed the critical capabilities in the partner selection. Berardi and de Brito's (2021) and Veleva and Bodkin's (2018) agreed that complementary capabilities in a partner foster success.

1.2.3 Relationship Management Mechanisms

The literature reviewed highlighted the lack of trust and transparency as the main barrier to sustaining collaborative relationships (Brito & Miguel, 2017; Hina et al., 2022; Tura et al., 2019; Shekarian, 2020). Creating future-focused relationships with supply chain partners was considered an antidote to eliminate this barrier by Tura et al. (2019), however, long-term partnerships escalated the risk of overreliance on supply chain partners for the organisation. Tura et al. (2019) observed that the mechanisms to secure the long-term commitment amongst supply chain actors had not been established.

The position of each supply chain partner on the supply chain impacted the interactions between partners and the sustainability of the collaboration. Brito and Miguel (2017) illuminated the risk of underhandedness that arose when bargaining power positions in the supply chain were unbalanced. This echoed Berardi and de Brito's (2021) assertions regarding the power asymmetry being a key consideration in managing collaborative relationships. This research sought further insights into the mechanisms used to manage power asymmetry in supply chain relationships.

1.2.4 Barriers and Enablers to the Transition

The diverse interpretations of a CE and the lack of a legislative framework for implementation were considered barriers which hampered the progress towards transitioning to a CE. Maione et al.'s (2022) findings confirmed Kirchherr et al.'s (2018) assertion that legislative frameworks were a key enabler to the transition. Kirchherr at al. (2018) further highlighted the high upfront investment cost and higher prices of circular product alternatives as a barrier. Maione et al.'s (2022) case study found the root cause to these barriers was the different understanding and focus by various companies led to firms in the same sector implementing different CE strategies. This discord generated

niche solutions within the same sector and thus delayed the benefit of scale economies.

The organisational mindset shift was widely supported as a fundamental first step to enable a company to transition towards a CE (Batista et al., 2018; Hussain & Malik, 2020; Korhonen et al., 2018). The fundamentally different nature of a CE compared to other sustainability frameworks demands changes at the core of an organisation's culture to switch and thus create a willingness to redesign the business model and make the necessary investments to implement CE strategies.

This research sought to gain new insights into the barriers and enablers of a transition to a circular economy.

1.2.5 Sustainability Outcomes

Genovese et al. (2017) emphasised that the circular economy reached beyond lessening the negative impacts on the environment to the design of sustainable production systems in which resources and energy circulate in the system indefinitely. This was supported by Hussain and Malik (2020) who argued that although the CE intersected with sustainable supply chain management (SSCM), SSCM had incremental impact on sustainability whereas a transition from linear to circular supply chains required revolutionary changes to the business model that were aimed at achieving sustainability outcomes.

Both Sudusinghe and Seuring (2022) and Veleva and Bodkin (2018) found that in terms of sustainability outcomes, the attention of CE studies and CSCs was on environmental preservation and economic performance with very little attention to the social aspects. Veleva and Bodkin (2018) argued that, through supply chain collaborations between large firms and entrepreneurial firms, the CE could facilitate social outcomes like creating employment, education and training opportunities, unlocking access for previously disadvantaged communities, and promoting social equity. Sudusinghe and Seuring (2022) concurred this, stating that the motivation to address social issues in circular supply chain operations was promoted by parties external to the focal firms.

This research sought to gain a better understanding of the circular economy's contribution to sustainable development based on the three pillars of economic, environmental and social outcomes.

1.3 Research Question

The main research question for this study was situated in literature and was informed by

a literature review on the circular economy and a recommendation for future research by Berardi and de Brito (2021) stating that there was a need for deeper insights into collaboration in supply chains to understand its contribution to the transition to a CE and its contribution to sustainable development outcomes. The main research question formulated as:

How does supply chain collaboration drive the transition to a circular economy and its contributions to sustainable development outcomes?

In the analysis of the literature related to the topic, further propositions and research gaps were identified such as the need to have a better understanding of the role of partner selection and partner capabilities in supply chain collaboration and to further explore what were the mechanisms used to manage the collaborative relationships. Two research questions and three sub questions were formulated from the main constructs of the main topic informed by the literature review.

Research Question 1: What is the role of supply chain collaboration in the transition towards a circular economy? (Berardi & de Brito, 2021; Hina et al., 2022; Hussain & Malik, 2020)

Research sub-question 1: What role do partner selection and partner capabilities play in the supply chain collaboration for transition to circular economy? (Berardi and de Brito, 2021; Jager & Piscicelli, 2021; Tura et al., 2019; Veleva & Bodkin, 2018)

Research sub-question 2: What mechanisms are used to manage collaborative relationships in the supply chain collaborations? (Berardi & de Brito, 2021; Brito & Miguel, 2017; Hina et al., 2022; Shekarian, 2020; Tura et al., 2019)

Research sub-question 3: What are the barriers and enablers to transition towards a circular economy? (Batista et al., 2018; Hussain & Malik, 2020; Kirchherr et al., 2018; Maione et al., 2022)

Research Question 2 - How does the transition to a circular economy lead to sustainable development outcomes? (Geissdoerfer et al., 2017; Kirchherr et al., 2017; Sudusinghe & Seuring, 2022; Veleva & Bodkin, 2018).

The research questions are discussed in further detail in Chapter3.

1.4 Research Aims

The first research aim was to gain deeper insights and understanding of the role of supply chain collaborations in advancing the circular economy and its contribution to sustainable development. The research further aimed to gain insights into how actors involved in the supply chain collaborations for a transition to a CE dealt with partner selection, managing the relationships and the sustainability outcomes. As a result, the research aims to use these insights to make practical recommendations to management to equip them in the transition and other stakeholders to enable the acceleration of adopting CE principles by businesses.

Furthermore, the research aimed is to use the results to develop a conceptual framework to present the key constructs and themes of supply chain collaboration for a CE.

1.5 Research Contribution

1.5.1 Business relevance

Despite the compelling case for businesses to transition to a circular economy, the Ellen MacArthur Foundation (EMF, 2021) acknowledged there were some challenges for businesses in transforming their business models. The first challenge was the innovation required to design waste out, and secondly, collaboration and purpose alignment with partners in the value chain was vital. The lack of knowledge in navigating these challenges was a deterrent for firms that were interested in transforming their business models to circular (EMF, 2021).

This research focused on the supply chain collaborations for a CE, with the aim to equip management in navigating the challenges related to supply chain collaborations and thus enable them to transition towards a CE. The aim was to also assist other stakeholders with awareness of the roles they could play in unlocking the barriers to implementing a CE thus circumventing the global challenges facing the planet and its people.

1.5.2 Theoretical relevance

This theoretical relevance of this study was to confirm and add to the existing body of knowledge by making a potential contribution to the circular economy literature. The research also added new insights that are potential refinements to the CE literature. These potential refinements to the CE literature included *supplier development incentives* and *financial capability* (related to collaborations)*; lack of institutional coordination*, *economies of scale*, *global frameworks,* and *consumer advocacy* (related

to the barriers and enablers of the transition); and lastly, *country and sector context* related to sustainable development outcomes. The research also added new insights that are potential extensions to the CE literature, related to supply chain collaborations for a circular economy. These potential extensions to the CE literature included *partner due diligence* and *partner support*.

This research has made a potential contribution to CE literature through the conceptual framework that has been developed to present the key constructs and themes of supply chain collaboration for a CE.

1.6 Scope of the Research

The theoretical scope of the research was the supply chain collaboration literature, specifically within the context of a circular economy. Literature encompassing circular business models and the supply chains supporting such models was included as it pertains to the transition. Further, the literature on the key research constructs such as partner selection for collaboration and management of collaborative relationships (specifically collaborating for a circular economy) was also covered, barriers and enablers of the transition and lastly, the sustainable development contributions of the circular economy as a construct.

The physical scope of the research was determined by the purposive sampling was used to demarcate the boundaries of the research. The selection criteria specified organisations operating in the South African (and African) emerging markets. Although Hina et al.'s (2022) systematic literature review established that previous studies on the CE had been geographically diverse, there were limited studies done in developing countries. The setting in South Africa was therefore selected to contribute by extending the literature utilising a developing country perspective. Further, the research used three specific industry sectors to explore circular economy and the research questions

1.7 Research Report Overview

This research report is organised into seven chapters. Chapter 1 is this introduction to the business problem. Chapter 2 is the detailed literature review which is organised into 12 sub-sections that flow into each other setting out the circular economy literature context and thereafter exploring the literature on the key constructs of the research questions. This flows into Chapter 3 which describes the main research question and sub-questions as informed by the literature gaps identified in the literature review. Chapter 4 discusses the various components of the research methodology and design.

Thereafter, the research findings are presented in Chapter 5 organised by each research question. Chapter 6 is organised similarly to Chapter 5 and discusses the research findings through a rigorous comparative analysis with the literature. The report concludes in Chapter 7, with the principal theoretical conclusions, research contribution, recommendations for management and other stakeholders, limitations of the research, and finally recommendations for future research were made. The final conceptual framework is presented in Chapter 7.

2. CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The following section is a review of various articles found in literature on the topics of the circular economy, sustainability, supply chain collaboration and how it influences the transition towards a circular economy and how the transition towards a circular economy contributes to sustainable development outcomes. The literature on the process of forming and managing collaborative relationships is explored including the key challenges to successful collaboration and the transition. The articles on the topic were reviewed to understand the current debate in nascent literature. To begin, a description of the sourcing criteria of the literature reviewed in this chapter is provided. This is followed by a discussion of what scholars say about each of the constructs in the topic. The researcher then provides an analysis of the selected articles which compares the similarities and the differences on the findings and assertions of the authors. In the comparative analysis the researcher was seeking to gain understanding and evaluate the current gaps in the literature to identify the need for this research into this topic. The section concludes with a conceptual model based on this review of the literature.

2.1 Search Criteria

The topic of circular economy has become increasingly popular in academia, governments, and the business community (Berardi & de Brito, 2021). Based on the key constructs of the topic, the search for the literature reviewed was conducted through a search for the key words: ‘’circular economy”, “sustainability”, “sustainable development”, “sustainable outcomes”, “supply chain collaboration”, “collaboration”, “transition to circular”, “circular economy business models”, and “circular business models”. To ensure that the articles were recent debates on the topic, a timeframe of the last 6 years was used therefore any papers prior to 2017 were deemed not relevant for the literature review, save for seminal papers that have influenced later developments on the topic or constructs for which there was no time limit of when these were published.

Following the review of the anchor article by Berardi and de Brito (2021), further searches on the process of forming the collaborative relationships were performed with added key words: “partner selection”, “supplier selection”, “relationship management mechanisms”, and “barriers and enablers”. The key word searches were conducted through the main databases of academic publications such as Google Scholar, Scopus, JSTOR, Web of Science and Science Direct. Verification of citations was performed through Herzing’s Publish or Perish.

Articles that were considered were those appearing on top-rated journals. The journal ratings were verified on the CABS (Chartered Association of Business Schools) Academic Journal Guide (AJG) as updated in 2021. The AJG provides a guideline on the subject matter and relative quality of journals in which business and management academics publish their research. Articles published in predatory and open access journals were avoided. The single exception of open access journal was the *Sustainability* journal, based on the quality of the scholars, i.e., only the highly rated/cited scholars' work published in this journal were considered. The journals that are included in this literature review are: *Journal of Cleaner Production, Business Strategy and the Environment, Strategic Management Journal, Sustainable Production and Consumption, International Journal of Production Research, Resources, Conservation and Recycling, International Journal of Production Economics, Journal of Supply Chain Management, Ecological Economics,* and *Sustainability.*

The roadmap of the Literature Review is presented in Table 1 below.

Table 1: Roadmap of the Literature Review

2.1 Introduction						
2.2 Search Criteria						
Section number	**Main Headings**	**Subsection 1**	**Subsection 2**	**Subsection 3**	**Subsection 4**	**Subsection 5**
2.3	**2.3 Review on the Circular Economy**	2.3.1 Description of the Circular Economy in Literature	2.3.2 Analysis of the Literature on the Circular Economy	2.3.2 Concluding remarks on the Circular Economy Literature		
2.4	**2.4 Review of Circular Business Models**	2.4.1 Description of the Circular Business Model Literature	2.4.2 Analysis of Literature on Circular Business Models	2.4.3 Concluding remarks on the Circular Business Models Literature		
2.5	**2.5 Review of Supply Chain Evolution Literature**	2.5.1 Description of Supply Chain Evolution in Literature	2.5.2 Analysis of Supply Chain Evolution Literature	2.5.3 Concluding remarks on Supply Chain Evolution Literature		
2.6	**2.6 Review of Supply Chain Collaboration Literature**	2.6.1 Description of Supply Chain Collaboration Literature	2.6.2 Analysis of Supply Chain Collaboration Literature	2.6.3 Concluding remarks on Supply Chain Collaboration Literature		
2.7	**2.7 The Role of Partner Selection and Partner Capabilities**	2.7.1 Concluding remarks on Partner Selection Literature				
2.8	**2.8 Management of collaborative relationships**	2.8.1 Concluding remarks on Management of collaborative relationships				
2.9	**2.9 Review of Barriers and Enablers to Transition to a CE**	2.9.1 Description of Barriers Literature	2.9.2 Analysis of Barriers Literature	2.9.3 Description of Enablers in Literature	2.9.4 Analysis of Enablers Literature	2.9.5 Concluding remarks on Barriers and Enablers to Transition
2.10	**2.10 Review of contribution to Sustainable Outcomes**	2.10.1 Description of Contribution to Sustainable Outcomes	2.10.2 Analysis of Contribution to Sustainable Outcomes	2.10.3 Concluding remarks on Contribution to Sustainable Outcomes		
2.11 Conclusion						
2.12 Conceptual Framework						

2.2 Review on the Circular Economy

2.2.1 Description of the Circular Economy in Literature

As the concept of circular economy becomes increasingly popular in academia, governments, and the business community (Berardi & de Brito, 2021; Ferasso et al., 2020; Geissdoerfer et al., 2017), several studies have focused on clarifying the distinction of terms used to refer to the concept (Geissdoerfer et al., 2017; Geissdoerfer et al., 2018; Kirchherr et al., 2017; Korhonen et al., 2018).

In their systematic literature review, Berardi and de Brito (2021) selected a definition of CE with the aim of providing a boundary condition and thus filter those studies that would enable them to assess the scholarly discussion of challenges related to supply chain collaboration in the circular economy. Berardi and de Brito (2021) identified the use of various CE terms interchangeably but with varying interpretations by scholars and desired to eliminate studies that presented circular practices in a linear logic, for example. This demonstrated the challenge for scholars to meaningfully contribute to the debate and the challenge for business to achieve coordinated implantation of the circular economy.

Kirchherr et al.'s (2017) systematic literature review was focused on gaining a level of consensus in the scholarly understanding of the concept and thus enable growing contribution to the field. The literature they reviewed was based on an analysis of 114 definitions. Kirchherr et al., (2017) found that most scholars, in their definition of the CE, had focused on the economic and environmental imperatives of the CE, whilst ignoring the social impact and consideration of future generations. This had influence on implementation and the level of focus paid to the pillars of sustainable development performance. Kirchherr et al.'s (2017) asserted that the CE concept was established on the sustainability outcomes. Kirchherr et al. (2017) further elaborated that it was necessary to include the circular business models, which were enablers of the CE, in a comprehensive definition.

Kirchherr et al. (2017) provided a definition summarized as follows: "A circular economy describes an economic system that is *based on business models* [emphasis added] which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes" (Kirchherr et al., 2017, p.224). Kirchherr et al. (2017) further added that these business models could take the form of organisations or products, communities of businesses or even regional or country level ecosystems. The definition incorporated the sustainable development outcomes as the three pillars of the triple bottom line. This was the only definition found in the literature that also encompassed the various operational levels of the CE at the organization, community, country level and beyond.

The relationship between circularity and sustainability is sometimes blurred and ambiguous. Geissdoerfer et al. (2017) sought to improve clarity regarding the Circular Economy and Sustainability concepts. They asserted that the imprecision of the definitions of the terms Circular Economy and Sustainability, limit the ability of research to contribute appropriately to the pool of knowledge on these important subjects. The

outcome of their review of relevant literature defined the CE as “a regenerative system in which resource input and waste, emission and energy leakage are minimized by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance and repair, reuse, remanufacturing, refurbishing, and recycling.” (Geissdoerfer et al., 2017, p.759). Against the definition of sustainability as “the balanced and systemic integration of intra and intergenerational economic, social, and environmental performance.” (Geissdoerfer et al., 2017, p.759). The authors considered the similarities and differences found in CE literature and concluded that the CE was a condition for sustainability and that a CE also had a cost/benefit trade-off relationship with sustainability. They therefore contend that framing the CE as a category of sustainability was most suitable to clarify the distinction whilst concurrently highlighting the vast array of complementary approaches that can be adopted in practice.

In the article by Korhonen et al. (2018), they argued that the contested nature of the CE concept is a result of divided theories originating from various technical and non-technical disciplines such as cleaner production, industrial ecology and natural capitalism. In addition, the discussions of the CE by practitioners were ahead of the scholarly analysis and engagement with the concept (Korhonen et al., 2018). The scholars recognised that academic dialogue demanded a definition that served to unite both the practitioners’ lived experience and the scholars’ conceptualization of the concept. They suggested a definition that comprehensively incorporated the core objectives of a CE being the three pillars of sustainability with an extension of the definition to the crucial modes of implementation. Korhonen et al. (2018) compiled a definition of the CE for the purposes of academic dialogue as:

> A sustainable development initiative with the objective of reducing the societal production-consumption systems’ linear material and energy throughput flows by applying materials cycles, renewable and cascade-type energy flows to the linear system. CE promotes high value material cycles alongside more traditional recycling and develops systems approaches to the cooperation of producers, consumers and other societal actors in sustainable development work. (Korhonen et al., 2018, p. 547).

This definition incorporates the types of business models, the sustainable development outcomes, the CE transition elements as well as frames the CE concept as an ecosystem whilst also integrating the process enabler (i.e., the cooperation of players) into thinking about the CE.

Govindan and Hasanagic (2018) performed a literature review of articles on the circular

economy and found that the two definitions that were most used by researchers were: 1) a circular economy is an economic system with a closed or circulating flow of raw materials and the use resources and energy multiple times, and 2) a circular economy can be described as an economy based on a “spiral-loop system” that curtails material and energy inputs and reduces negative environmental impacts whilst achieving economic, social and technological development. They concluded that a shift from linear to a circular economy was necessary to prevent increased demands for natural resources put a strain on the environment. A linear economy is described as a “take-make-use-destroy” system where natural resources are used to create products which are then sold, used and disposed of at the end of their life or usage as waste material. The circular economy aims to reduce the use of natural resources and harmful elements, decrease the volume of waste, reduce greenhouse gas emissions as well as switch to renewable and sustainable energy suppliers (Govindan & Hasanagic, 2018). Govindan and Hasanagic (2018) further concluded that organisations could realise economic growth and returns by employing circular economy practices in supply chains which would facilitate the recovery of the raw materials that are currently disposed of in the linear system.

Govindan and Hasanagic (2018) adopted the Ellen MacArthur Foundation depiction of the circular economy as illustrated in Figure 1. They assert that impact of circularity would be stronger if the circles in the figure were tighter, meaning the products should continue circulating for as long as possible and reclaim as high a value as possible (Govindan & Hasanagic, 2018).

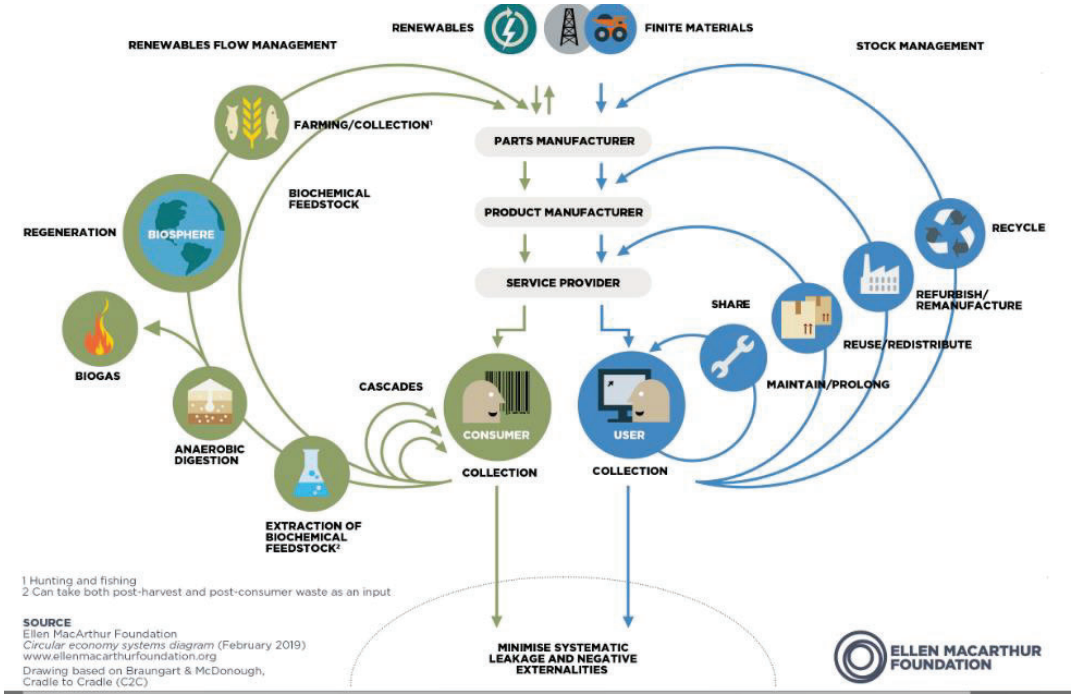


Figure 1: The "butterfly diagram" showing the continuous flow of materials in a circular economy

Source: The Ellen MacArthur Foundation, The butterfly diagram: visualising the circular economy (February 2019), https://ellenmacarthurfoundation.org/circular-economy-diagram (as depicted in Govindan and Hasanagic (2018))

2.2.1 Analysis of the Literature on the Circular Economy

The academic narratives that were appraised highlight the existing ambiguities and contradictions in defining the Circular Economy (CE) as well as demonstrates the importance of discerning the appropriate definition of the CE for research upfront in order to make a meaningful contribution to the field.

Due to the interdisciplinary nature of the concept as well as diverse models of implementation, the different stages of transition by industry and/or by country, there are various contributing causes to the disparate interpretations of the CE. Berardi and de Brito (2021) attributed the varying and sometimes inconsistent interpretations of terms referring to CE to the acceleration of interest in the topic, mainly catapulted by regulation (particularly in China (Geissdoerfer et al., 2017)), coupled with a corresponding low understanding of the concept in general.

The definition compiled by Berardi and de Brito (2021) is not considered suitable for the proposed research, because their study was a meta-analysis of other research, whereas the proposed research will be applied qualitative research. The fact that the proposed study is applied research provides the opportunity to exclude examples that apply

circular practices in a linear logic (Berardi and de Brito, 2021) via the research design and sampling criteria.

The definition compiled by Kirchherr et al. (2017) incorporated the CE's aims and extended the definition to the central mode of implementation. Further, Kirchherr et al.'s (2017) definition affirmed the outcomes of circularity, i.e., to achieve sustainable development and thus concurred Geissdoerfer et al.'s (2018) assertion that a Circular Economy Business Model (execution tool at the micro or company level) was in effect a subset of Sustainable Business Models. According to both articles, the circular economy was closely linked to the three pillars of environmental preservation, economic growth, and social gains. This demonstrated that the concept of circular economy and that of sustainability or sustainable development were directly associated in literature.

Unlike the Kirchherr et al. (2017) definition, the definition offered by Korhonen et al. (2018) recognised that complete circularity was unachievable and defined the CE as a transitioning process of reducing the negative impacts of a linear system and promoting circular practices alongside traditional environmental preservation practices.

2.2.2 Concluding remarks on the Circular Economy Literature

The literature reviewed highlighted that the concept of circular economy had become increasingly popular in academia, governments, and the business community (Berardi & de Brito, 2021; Ferasso et al., 2020; Geissdoerfer et al., 2017). It was observed that the there remained existing ambiguities and contradictions in defining the Circular Economy (CE). Due to the interdisciplinary nature of the concept as well as diverse models of implementation, the different stages of transition by industry and/or by country, there were various contributing causes to the disparate interpretations of the CE. This demonstrated the importance of discerning the appropriate definition of the CE for research upfront in order to make a meaningful contribution to the theory on the subject.

This research considered a transition to a circular economy as any operational product, organisation, system, supply chain or business model (Kirchherr et al., 2017) that utilised the CE strategies defined by Salvioni et al. (2022) as the 9Rs (Reuse, Repair, Recycle Refurbish, Rethink and Remanufacture, Repurpose, Recover, and Reduce) or any of the CE principles of slowing loops and closing resource loops as summarised by Vermunt et al. (2019). This was the definition used for the purpose of this research to gain deeper insights into the role of supply chain collaboration in facilitating the transition to a circular economy.

2.3 Review of Circular Business Models

The preceding section illustrated that the CE is an ecosystem made up of various actors which include business entities, government, NGOs, consumers as well as institutions. Most of the CE definitions incorporate the circular business model in defining the system. To effect systemic change, it is considered the responsibility of businesses to re-examine how they generate revenue and adapt their business models to incorporate CE principles. The CE cannot be implemented without the adaptation or creation of new strategies and enablers called circular business models (CBM) and CE strategies. This section delves into the literature on circular business models and CE strategies that can be employed by organisations in the transition.

2.3.1 Description of the Circular Business Model Literature

2.4.1.1 Circular Business Model as a subset of Sustainable Business Model

Geissdoerfer et al. (2018) described circular business models (CBM) as a sub-set of Sustainable Business Models (SBM) albeit with specific and distinguishing features. Geissdoerfer et al. (2020) posited that CBMs included recycling loops (closing), efficiency innovations (narrowing), life cycle extensions (extending), a sharing economy (intensifying), and the replacement of product by a service or technology (dematerialising), as demonstrated in Figure 2. The various types of CBMs expand the boundary of the organization and forces it to not only take on additional activities but to reconsider the value chain of its products (Geissdoerfer et al., 2018). The CBM becomes an aggregate organisation whose success is determined by the dealings among the role-players in those value chains (Berardi & de Brito, 2021; Geissdoerfer et al., 2018). Collaboration, as a key enabler of the circular economy is thus equally central to advancing sustainability performance and achieving sustainable outcomes.

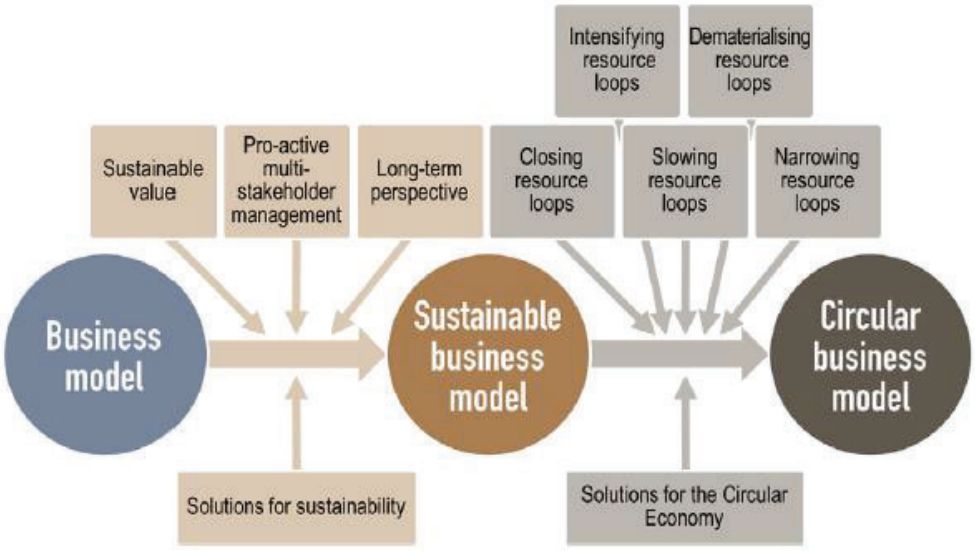


Fig. 1. Comparison of traditional, sustainable, and circular business models.

Figure 2: Comparison of traditional, sustainable, and circular business models (Source: Geissdoerfer et al., 2018)

The term business model refers to the elements in the organisation's business enterprise that link the customer value proposition with the company's capability to make profit (Ranta et al., 2018). The three elements of a business model are value proposition, value creation and delivery and value capture. The distinction between the CE and the CBM (also referred to as circular economy business model or CEBM in literature) is that, a CE is an economic model defined by the principles of preserving resources through reducing, reusing, recycling, redesign, repair, remanufacturing or refurbishing, whereas a CBM, on the other hand, describes the mechanisms through which companies generate value through the CE principles, practices or strategies (Geissdoerfer et al., 2017; Hina et al., 2022). According to Geissdoerfer et al. (2018) the key difference between conventional business models and the circular business models was the value creation and delivery element, which was facilitated through the supply chains. Geissdoerfer et al. (2018) concluded that the circular supply chain (CSC) was the mechanism or value creation and value delivery lever of executing the circular business model.

2.4.1.2 CE Strategies employed in the Transition

Prior to delving deeper into the supply chains and value chains that connect organisations in a CE, it is valuable to first discuss the CBM categories, CE principles and CE strategies that could potentially be employed by organisations. CE principles can

be broadly conceptualised as either rethinking resource use, rethinking product use or rethinking the product disposal.

Vermunt et al. (2019) simplified the types of Circular Business Models into two main categories i.e., 1) slowing loops and 2) closing resource loops:

1) Slowing loops which include product life extension models which employ reuse, remanufacture and repair strategies. Note, "product-as-a-service" models where companies sell a service or performance instead of products (i.e., rethinking product use to reduce resource utilisation) are also classified as slowing loops, and
2) Closing loops which include resource recovery (i.e., recycling or recovery of materials to make new products) as well as circular supplies (i.e., replacing virgin resources with recycled, fully renewable or biodegradable resources).

The type of business model dictates the skills requirement and the level and extent of innovation required to implement it. The business model also determines the value chain, what the supply chain nodes are thus the relevant bargaining power of the partners based on those nodes.

Salvioni et al. (2022) devised a framework which summarises the CE strategies referred to as the 3Rs (Reuse, Repair, Recycle), the 4Rs (adds Refurbish), the 6Rs (adding Rethink and Remanufacture) and lastly the 9Rs (which adds Repurpose, Recover, and Reduce).

Table 4. The "R" framework.

Framework	3Rs	4Rs	6Rs	9Rs
Strategies	*Reuse* *Repair* *Recycle*	*Reuse* *Repair* *Recycle* *Refurbish*	*Reuse* *Repair* *Recycle* *Refurbish* *Rethink* *Remanufacture*	*Reuse* *Repair* *Recycle* *Refurbish* *Rethink* *Remanufacture* *Repurpose* *Recover* *Reduce*

Table 2: The "R" Framework (Source: Salvioni et al., 2022, p.5)

These strategies suggest that the production and consumption loop can be made circular through either:

1) 'Reuse' (discarded products maintaining their original functions),
2) 'Repair' (restore products for reuse),
3) 'Recycle' (materials are reprocessed to produce other products),
4) 'Refurbish' (update products to recover their original qualities),
5) 'Rethink' (use product more intensively or transform product into services, i.e., rent instead of sell),
6) 'Remanufacture' (product parts used in new products post-use),

7) ‘Repurpose’ (post-use products used as parts for new products),
8) ‘Recover’ (waste or post-use products to generate energy), or
9) ‘Reduce’ (products made with less resources and materials).

Salvioni et al. (2020) also made mention of the concept of Refuse (scrapping a product’s function or presenting the same function with a fundamentally different product) as an additional CE strategy.

Vermunt et al. (2019) posited that these Rs were hierarchical in terms of the extent of circularity, with the most desired option being “reduce” in descending order to the first R. The level of effort and paradigm shift required is also increased as one moves towards Reduce, hence the early stages of the transition are expected to include Reuse, Repair or Recycle models.

Chen et al. (2020) noted that the CE had been touted as a key contributor to sustainable development. The CE was described by Geissdoefer et al. (2017) as a subset of sustainability which emphasised its role on sustaining the availability of resources. The long-term nature of sustainability outcomes requires consideration of the extent of the transition to a CE to establish its contribution. Chen et al. (2020) posited that the dynamic flow perspective of the transition was important in considering the appropriate tools and enablers of the transition to CE. They identified that current research had focused on the early stages of the transition where organisations sought to convert the linear economy challenges into new prospects.

2.3.2 Analysis of Literature on Circular Business Models

Vermunt et al. (2019) provided a simplified understanding of the various types of Circular Business Models into two main categories i.e., 1) slowing loops and 2) closing resource loops. These categories incorporate the various CE strategies in the framework devised by Salvioni et al. (2022) which summarises the CE strategies referred to as the 3Rs (Reuse, Repair, Recycle), the 4Rs (adds Refurbish), the 6Rs (adding Rethink and Remanufacture) and lastly the 9Rs (which adds Repurpose, Recover, and Reduce). Vermunt et al.’s (2019) categories were summarised to assess the complexity of the supply chain collaboration so as to determine its relevance. Salvioni et al. (2022) were interested in developing a comprehensive list of the various strategies to demonstrate they could be conceptualised as either rethinking resource use, rethinking product use or rethinking the product disposal. Both these perspectives assist to focus on the similarities of the diverse models available in different sectors to assess the mechanisms of implementation.

Vermunt et al. (2019) postulated that the type of business model dictated the skills requirement and the level and extent of innovation required to implement it. The business model also determined the value chain, what the supply chain nodes are thus the relevant bargaining power of the partners based on those nodes. Salvioni et al. (2022) used a different lens to explain the hierarchical nature of the “R”s strategies in terms of the extent of circularity, based on the level of CBM transformation required, with the most desired option being “reduce” in descending order to the first “R”. The early stages of the transition were expected to include Reuse, Repair or Recycle models. These are important considerations for organisations in forming, partnering and managing their supply chain collaborations.

2.3.3 Concluding remarks on the Circular Business Models Literature

Scholars have devised useful frameworks and definitions to simplify the various circular business models and strategies that could be employed by organisations in their transition towards a circular economy. There are many terms used to define the transition strategies or models therefore these frameworks and summaries are useful in drawing similarities based on the driving CE principle. Further, the frameworks assist in framing the types of challenges and mechanisms that may be relevant in the supply chain collaborations that are formed. This research sought to explore the role of the selected circular business model or circular economy strategy, or principles selected by the organisation on the supply chain collaboration processes.

2.4 Review of Supply Chain Evolution Literature

Given that the research focused on the supply chains of the CE, an overview of the evolution of the supply chain into the CE provides context.

2.4.1 Description of Supply Chain Evolution in Literature

Berardi and de Brito (2021) considered the evolution of the supply chain in the CE starting with concepts of the sustainable supply chain and green supply chain management. Green Supply Chain Management (GSCM) introduced social and environmental aspects in response to societal advocacy address pollution. This was followed by Sustainable Supply Chain Management (SSCM) which focused on stakeholders and the environment assessing supply chain partners and consumer services. Circular economy strategies within the supply chain, including the focus on the three pillars for sustainable development outcomes were incorporated as a value creation mechanism (Berardi and de Brito, 2021). Berardi and de Brito (2021) proposed that supply chain collaboration was the route to merging the collaborating entities’

expertise and resources towards both technical and social innovation.

Batista et al. (2019) postulated that the increasing academic interest in the sustainability of supply chains bore the emergence of four supply chains descriptions, namely: green supply chains (GSC) focusing on minimising negative environmental impacts, sustainable supply chain management (SSCM) focusing on governance, operations and sustainable strategies, and CE related supply chains such as reverse logistics, closed-loop supply chains (CLSC which includes circular supply chains or CSC). Batista et al. (2019) introduced the concept of open-loop supply chains (OLSCs). The distinction was that CLSCs relied on the original equipment manufacturers (OEMs) for product recovery whereas OLSCs incorporate third parties in the product or materials recovery at the end of life.

Hussain and Malik (2020) concluded that the OLSCs accentuated the collaboration in supply chains as a critical element, in line with the definition of the CE as an industrial symbiosis. The OLSC has a wide span in the supply chain network integrating several actors from various sectors collaborating in the recovery of waste energy and materials for use as raw materials or inputs into other processes. The cooperation of the various entities involved in the value network was considered critical for the implementation of the CE and the achievement of the targeted outcomes. This led Hussain and Malik (2020) to conclude that a transition to circularity required an expansion of the traditional collaborative interactions of upstream and downstream role players in the supply chain to extend beyond organisation and industry boundaries.

2.4.2 Analysis of Supply Chain Evolution Literature

The increasing academic interest in the sustainability of supply chains resulted in various supply chain paradigms. Batista et al. (2019) described supply chains borne out of this interest evolving from a focus on environmental impacts (green supply chains), broadening to strategy, operations and governance (sustainable supply chains) and lately incorporating circular economy strategies and industrial symbiosis (reverse logistics, CLSC, CSS and OLSC). Berardi and de Brito (2021) concurred with the definitions of emphasis of each stage of the supply chain management evolution strategies offered by Batista et al. (2019).

Berardi and de Brito (2021) further explained that circular economy strategies within the supply chain, including the focus on the three pillars for sustainable development outcomes were incorporated as a value creation mechanism. This was supported by Batista et al. (2019) who introduced the concept of open-loop supply chains (OLSCs). The distinction was that CLSCs relied on the original equipment manufacturers (OEMs) for product recovery whereas OLSCs incorporate third parties in the product or materials

recovery at the end of life.

Although Berardi and de Brito (2021) had proposed that supply chain collaboration was the route to merging the collaborating entities' expertise and resources towards both technical and social innovation, Hussain and Malik (2020) provided a perspective of how this supply chain evolution could impact the types of collaborations required to facilitate the transition. Hussain and Malik (2020) concluded that the OLSCs accentuated the collaboration in supply chains as a critical element, in line with the definition of the CE as an industrial symbiosis. The OLSC has a wide span in the supply chain network integrating several actors from various sectors collaborating in the recovery of waste energy and materials for use as raw materials or inputs into other processes.

2.4.3 Concluding remarks on Supply Chain Evolution Literature

The increasing interest in the sustainability of supply chains resulted in an evolution of the supply chain management practices and types of supply chains culminating in the latest developments of circular supply chains. The various types of supply chains including CSC, CLSC, OLSP and reverse logistics are vital for the implementations of the CE. Insights by scholars such as Berardi and de Brito (2021) and Hussain and Malik (2020) on the important of supply chain collaboration as the route towards both technical and social innovation are important. Further, the impact of the supply chain management evolution on the types of collaborations required to facilitate the transition are key. As per Hussain and Malik's (2020) conclusions, the supply chains for a transition to a CE have a wide span in the supply chain network integrating several actors from various sectors collaborating in the recovery of waste energy and materials for use as raw materials or inputs into other processes.

This research focused on collaboration in the supply chains with entities, in the same industry or cross sector who were part of the value chain making up the CE business model or required to fulfil the CE strategy elected by the lead/focal firm. These demand more extensive collaboration than the earlier concepts of sustainable supply chains.

2.5 Review of Supply Chain Collaboration Literature

2.5.1 Description of Supply Chain Collaboration Literature

In their study, Sudusinghe and Seuring (2022) observed that there was a requirement for the traditional supply chains to transition towards circular supply chains (CSCs) in line with the development of the circular economy to achieve improved sustainability performance. They further emphasised that the inter-organisational relationships across

supply chains needed to be redefined to achieve this. The scholars found that the collaborative relationship management mechanisms that support CE implementation included information and risk sharing, performance management frameworks, co-accountability responsibility for waste recovery and collaborating in the design of new products. Sudusinghe and Seuring (2022) posited that the CE strategy to be implemented determined the most appropriate supply chain collaboration mechanisms (information/knowledge/risk/responsibility sharing, governance etc.). For example, collaboration mechanisms such as sharing responsibility for recovering product at the end of life, drove the circularity of supply chains by enabling the return leg. The supply chain was further supported through collaborative process and logistics design.

Although collaboration was frequently cited as a prerequisite to implement circular economy strategies, more needed to be understood about the supply chain collaboration relationships that facilitate circularity (Leising et al., 2018; Veleva & Bodkin, 2018). Berardi and de Brito (2021) proposed that supply chain collaboration was the route to merging the collaborating entities' expertise and resources towards both technical and social innovation. In their study Berardi and de Brito (2021) identified that key challenges to successful collaboration included information and knowledge exchange. They further postulated that the prospects for the alignment of interest with supply chain collaboration partners was key to eliminating the challenges that were often encountered.

Berardi and de Brito (2021) highlighted innovation in a supply chain collaboration as a core driver of the transition towards a circular economy. However, this critical innovation could only be realised when the process and relationship management mechanisms effectively supported the collaboration. Berardi and de Brito (2021) posited that the ability to align interest (process) with supply chain partners was what could unlock the knowledge and information sharing (relationship) challenges thus enabling innovation (outcomes). It is therefore important to investigate how the processes of forming the collaborative relationships through partner selection as well as the mechanisms of managing the relationships played a role in driving the transition towards a circular economy.

Hina et al.'s (2022) research found that one of the external factors cited by scholars as a barrier to collaboration in the CE was the reluctance of organisations to share information. Hina et al. (2022) were not able to offer any possible solutions to the perceived reluctance to share information by organisations. This reluctance was identified as a typical trait amongst the organisations they researched. Hina et al. (2022)

called for further research into approaches that can be employed in managing collaborative relationships to stimulate information sharing. This further illustrates the gap in literature and the need for this research to delve into the relationship formation and management aspects.

Salvioni et al. (2020) made though-provoking findings regarding the role of the type of Circular Business Model being assessed in determining the extent to which supply chain collaborations facilitated a transition. Vermunt et al. (2019) also observed that the supply chain challenges to implementing the CE differed based on the circular business model (CBM) adopted by the firm. For example, firms encountered supply chain challenges in the resource recovery, product life extension, and circular supplies business models but this was not observed in the product-as-a-service model. This was primarily attributed to the huge reliance on external participants for the input of scrapped items and waste supplies in the former three models which is not the case in the product-as-a-service-model (Vermunt et al., 2019). Vermunt et al. (2019) concluded that the level of importance ascribed to supply chain collaboration was contingent upon the circular business model employed. Vermunt et al. (2019) demonstrated that in some CBMs supply chain collaboration was mandatory e.g., in a recycling model because waste management processes require downstream supply chain actors to facilitate, by contrast in a Reuse model (such as refilling reusable packaging), there was no need for the collaboration because the service providers would be the ones who coordinate the supply chain activities.

Tura et al. (2019) suggested that in collaborating for a CE transition, standardized knowledge sharing mechanisms established a conducive atmosphere for generating ground-breaking ideas, as does the alignment of interests and the alignment of mindsets or organisation cultures. Tura et al.'s (2019) research had examined collaborations between businesses as an enabler of the transition to CE.

Collaboration had been identified as a prerequisite to implementing circularity, particularly in the supply chain, however, Berardi and de Brito (2021) found that no studies had evaluated in depth how supply chain collaboration facilitates the evolution of the circular economy. In particular the role of supply chain partner capabilities as well as mechanisms for managing the collaborative relationships in facilitating the evolution of the circular economy or its contribution to sustainable development had not been explored (Berardi & de Brito, 2021). Berardi and de Brito (2021) called for in depth examination of supply chain collaboration for the advancement of the CE as well as its

role in sustainable development.

2.5.2 Analysis of Supply Chain Collaboration Literature

Hina et al.'s (2022) research explored the external barriers to successful supply chain collaborations and they, similarly to Berardi and de Brito (2021), found that one of the external factors cited by scholars as a barrier to collaboration in the CE was the reluctance of organisations to share information. Both these studies were assessing barriers and enablers of CE implementation. Berardi and de Brito (2021) took the perspective of supply chain collaboration whilst Hina et al. (2022) were using the perspective of circular business model execution, hence their study referred to business collaboration (in the value chain networks, therefore not necessarily supply chain partners) in this case. The Hina et al. (2022) study considered all value chain collaborations which in the context of transitioning towards circularity could be horizontal collaboration with industry peers.

Tura et al. (2019) were in agreement with Berardi and de Brito's (2021) proclamations and suggested that in collaborating for a CE transition, standardized knowledge sharing mechanisms establish a conducive atmosphere for generating ground-breaking ideas, as does the alignment of interests and the alignment of mindsets or organisation cultures. Tura et al. (2019) utilized the lens of business collaboration as an enabler of the transition to CE. Their angle of analysis thus differed from Berardi and de Brito's (2021) whose study was specific through the lens of the supply chain collaboration facilitating the transition to CE. Although the perspectives differ, the collaboration for CE phenomenon was the common thread and this highlighted the need for better understanding of business-to-business collaboration in order to transition towards the CE which could sometimes be in the supply chain or at industry or peer level. Industry level transformation towards circular economy form part of the transition and would have an impact on that industry's supply chains, therefore the insights remain relevant. Further research into collaboration in the supply chain would address this gap in literature and assist organizations deal with challenges in transitioning to circularity.

According to Hina et al. (2022), the literature they reviewed in their study indicated that the level of collaboration in a supply chain had an impact on the successful implementation of a CBM, without necessarily distinguishing the type of CBM or CE strategy in question (e.g., 5Rs of the circular economy: Redesign, Repurpose, Reduce, Reuse, Recycle). This finding was different to Vermunt et al. (2019), potentially because Hina et al.'s (2022) study did not go into the details of the specific types of CBMs. Vermunt et al. (2019) proffered an important argument though, that if incorporated, the

supply chain collaboration played a significant role of enhancing the economic viability in all circular models, which then facilitated the transition.

2.5.3 Concluding remarks on Supply Chain Collaboration Literature

Scholars such as Vermunt et al. (2019) and Salvioni et al. (2020) each made similar insights regarding the role of the type of the circular business model being assessed in determining the extent to which supply chain collaborations facilitated a transition. Vermunt et al. (2019) found that the behaviours and requirements for forming and managing the collaborative relationships were contingent on the CBM under review. Vermunt et al.'s (2019) observations were centered on the supply chain challenges that may be experienced in the implementation of a CBM. Vermunt et al. (2019) demonstrated that in some CBMs supply chain collaboration was mandatory e.g., in a recycling model because waste management processes require downstream supply chain actors to facilitate, by contrast in a Reuse model (such as refilling reusable packaging), there was no need for the collaboration because the service providers would be the ones who coordinate the supply chain activities. For this research, the researcher considered the context and implications of the circular business model or CE strategies employed in the collaborative relationships.

In their study Berardi and de Brito (2021) identified that key challenges to successful collaboration included information and knowledge exchange. These were similar findings by Hina et al.'s (2022) who also found that one of the external factors cited by scholars as a barrier to collaboration in the CE was the reluctance of organisations to share information.

Finally, scholars (Berardi and de Brito, 2021; Tura et al., 2019) agreed that in collaborating for a CE transition, standardized knowledge sharing mechanisms establish a conducive atmosphere for generating ground-breaking ideas, as does the alignment of interests and the alignment of mindsets or organisation cultures.

The literature review found that there was a gap in literature and therefore a need to gain a deeper understanding of supply chain collaboration and how it affects circular economy evolution and sustainability (Berardi & de Brito, 2021). The above findings by the various scholars contributed to the formulation of the research and its focus areas. Hina et al. (2022) recommended research into whether a higher level of collaboration had a positive effect on the CBM implementation. There is value in gaining more insight into the role of supply chain collaboration on the implementation of CBM or a CE.

It has already been established in this paper that the transition has to be viewed from a business model perspective because organisations utilize circular business models as a mechanism to create value through the CE principles. Therefore, this research sought to gather insights into how the supply chain collaboration facilitates the transition to a CE through the different types of CBMs and CE strategies incorporated. The supply chain collaborations considered in the research were restricted to supply chain collaborations for the purpose of implementing CE principles and thus only individuals who work for organisations that were involved in the supply chain of a firm that was transitioning towards circularity or were themselves transitioning towards circularity were considered as participants.

In the context of sustainability and the transition towards a circular economy, consideration of the value chain and life cycle assessments are important considerations. It is for this reason that the formation or partner selection and partner capabilities and how the relationships are managed also contribute to the success and longevity of the collaborative relationship.

2.6 The Role of Partner Selection and Partner Capabilities

Berardi and de Brito (2021) asserted that supply chain collaboration was vital to accessing and exploiting knowledge and leveraging innovation capabilities for new products and processes in the transition to a CE. The authors suggested that in choosing a partner, the assessment of the potential partners' capabilities must be accentuated and in particular their previous experience in knowledge exchange was a critical partner capability for supply chain collaboration. According to Berardi and de Brito, the capability to share information is a very scarce resource in organisations. They posited that exchanging knowledge strengthens the collaborative relationship through cementing the association with repeated exchanges over time.

Jager and Piscicelli (2021) proposed that organisations needed to start with an internal and external assessment of the project context and identify capability gaps, following which complementary capabilities could be sought. Their study also found that the top three partner capabilities that were valued by collaborative partners were: goal alignment, innovation, and communication capabilities. According to Tura et al. (2019), having similar mindsets or similar organisation cultures contributed towards building stronger relationships. Tura et al.'s findings correspond with the goal alignment in partner selection criteria identified by Jager and Piscicelli (2021).

Jager and Piscicelli (2021) had endeavored to gain insight into the partner selection process when setting up supply chain collaboration. The analysis of the planning phase aids to illuminate whether and to what extent the collaboration is in fact required to facilitate the transition and this answer lies on the chosen CBM. Vermunt et al.'s (2019) study explored the barriers of implementing CBM models and the type of business model proved to be a significant factor in terms of the supply chain barriers that may be encountered.

Veleva and Bodkin (2018) looked at the role of entrepreneurial firms in playing a complementary role in circular supply chains. They argued that strategic partnerships between large firms and small businesses create value and reduce costs through varied but complementary capabilities. For instance, small entrepreneurial firms have strong innovation capabilities and flexibility but may lack financial muscle and scale, therefore collaboration with larger corporates unlocks opportunities to implement CE initiatives.

Berardi and de Brito's (2021) study synthesized findings from the literature reviewed to identify the most valuable partner capabilities in a supply chain collaboration. Berardi and de Brito's systematic literature review study focused on the drivers of innovation in the CE transition hence the knowledge exchange was deemed as critical. By contrast Jager and Piscicelli''s (2021) study was an empirical study to develop a framework from literature and test it through qualitative interviews. Both Berardi and de Brito (2021) and Veleva and Bodkin's (2018) found similarities regarding the importance of finding complementary capabilities. Similar to Berardi and de Brito's (2021) strong focus on innovation as an outcome of the collaboration, Jager and Piscicelli (2021) highlighted innovation as a vital partner capability. This was similar in all three studies as innovation capability was also identified by Veleva and Bodkin (2018) as the value of selecting small firms being their flexibility which complements the rigidity of larger firms.

2.6.1 Concluding remarks on Partner Selection Literature

Partner selection should focus on complementary capabilities, previous collaboration experience and knowledge exchange (Berardi & de Brito, 2021; Jager & Piscicelli, 2021; Veleva & Bodkin, 2018). Whereas these are important aspects to be considered for viable supply chain collaborations towards the circular economy, the ability of partners to unlock innovation in the supply chain seems to be the key driver of a sustainable collaboration and facilitating the transition. This research study was designed to gain insights into the role of the partner selection process and partner capabilities on how supply chain collaboration facilitates the transition to a circular economy.

2.7 Management of collaborative relationships

A lack of trust as well as a lack of transparency between partners were some of the challenges and barriers highlighted as affecting supply chain partner relationships. Hina et al. (2022) ascribed the barriers to adopting circularity in supply chains to a lack of trust and transparency among the supply chain partners. Having identified this supply chain collaboration barrier, Hina et al. (2022) recommended future studies to delve into how firms can build trust and transparency in the supply chain. While Tura et al. (2019) concurred with the finding that lack of trust and transparency represents barriers, their approach, in contrast, proposed an antidote that building future-oriented relationships was what was needed to eliminate the barriers to collaboration. They argued that long-term commitment to the collaborative relationship could breed openness and allow standardized knowledge sharing mechanisms to be created (Tura et al., 2019). Contrary to Hina et al. (2022) who suggested further research and deeper understanding, Tura et al. (2019) proposed a means to address the identified barrier to collaboration. It is not clear though what mechanisms or tools or processes could be used to secure this long-term commitment amongst supply chain partners.

Shekarian (2020) arrived at a similar conclusion as Hina et al. (2022) and Tura et al. (2019) and asserted that a lack of transparency and formal governance structures may breed mistrust amongst supply chain partners. Shekarian's (2020) investigation focused on analysing the competitive and cooperative relationships amongst the supply chain participants to enhance value creation in closed loop supply chains, a type of circular business model. Hina et al. (2022) and Tura et al. (2019) were similar in that they both studied the collaborative relationships between supply chain partners. The solution proposed by Shekarian (2020) to better manage these relationships was that partners should develop a transparent profit-sharing mechanism and also ensure that all participants' profits are enhanced through the partnership (Shekarian, 2020) - transparency in value sharing. All three studies (Hina et al., 2022; Shekarian 2020; Tura et al., 2019) concur that lack of trust and lack of transparency has a negative impact on the collaborative relationships in the supply chain. The mechanisms offered to manage collaborative relationships include long term commitment, transparency in value sharing, open communication and formal governance structures. Further research into how firms can manage relationships to build trust and transparency was also suggested.

Hina et al. (2022) had a unique insight that geography, i.e. the dispersed locations of supply chain partners to could hinder collaboration for the implementation of CBMs. This

was not mentioned by the other scholars.

Brito and Miguel (2017) warned that whereas collaboration enhanced value creation, on the downside, collaborative relationships could also breed overreliance on partners. This challenged Tura et al.'s (2019) proposition that long-term commitment would be an antidote to lack of trust and transparency. Brito and Miguel (2017) asserted that the longer the duration of the relationship, the higher the interdependencies partners would have on each other, and that this presented a risk. The supply chain collaboration relationship therefore needed to also have mechanisms for managing the risk of overreliance on each other.

Brito and Miguel (2017) noted that the power balance between partners contributed to the longevity of supply chain relationships. This was due to its influence on the ability of partners to derive value as well as the governance dynamics of the relationship. Brito and Miguel's (2017) study was focused on the interplay between power asymmetry and governance mechanisms. They found that the choice of governance mechanisms i.e., relational vs. contractual was largely influenced by the power asymmetry in the buyer-supplier relationships. Brito and Miguel (2017) noted that underhandedness arose when bargaining power positions in the supply chain were unbalanced. This was supported Berardi and de Brito's (2021) assertions stating that the position of a partner in the supply chain ought to be considered as this contributed to power asymmetry being a key theme in managing collaborative relationships.

Franco's (2017) insights were similar to Berardi and de Brito's (2021) finding that the position in the supply chain played a role in the power dynamics of supply chain collaborations. Franco (2017) found that the company's position in the production value chain dictated how much they could influence the demand push or pull and thus the eagerness to collaborate in developing circular solutions. Upstream actors were more effective in influencing the downstream product design as they controlled the inputs. Downstream actors such as large retail outlets could influence demand and thus pull for circular or more sustainable raw materials from suppliers upstream. This contrasted with organisations providing intermediary services or components who had very little influence on pulling demand from their fellow suppliers upstream or creating demand for their circular products to the larger producers downstream (Franco, 2017). This research will endeavour to gain insights into the role of the position in the supply chain in the balance of power in collaborative relationships.

A unique insight not revealed by either Brito and Miguel (2017) or Berardi and de Brito (2020) was that the size of the buyer relative to its suppliers played a role in the power dynamics. Franco (2017) argued that smaller organisations (at any position on the supply chain) found it difficult to convince their larger supply chain partners to collaborate circular efforts due to the lack of economies of scale to provide customised production runs.

2.7.1 Concluding remarks on Management of collaborative relationships

There are many factors that contribute to the value and sustainability of collaborative relationships amongst which building trust, maintaining transparency were a recurring theme presented by many scholars (Brito & Miguel, 2017; Hina et al., 2022; Tura et al., 2019; Shekarian, 2020) as well as the role of power asymmetry (Brito & Miguel, 2017; Franco, 2017) in the collaborative relationships. It is important that mechanisms be put in place to ensure the interactions between partners in a supply chain collaboration are nurtured to facilitate the transition towards a CE. This research therefore sought to gain further insights into how trust, transparency and power asymmetry played a role in maintaining successful supply chain collaboration relationships for a transition towards a circular economy. This research endeavoured to explore the role of the position in supply chain as well as size of an organisation in determining the power asymmetry and its effect on the collaborations.

2.8 Review of Barriers and Enablers to Transition to a CE

2.8.1 Description of Barriers Literature

Kirchherr et al. (2018) found that business and government officials considered the lack of understanding and consciousness from consumers, as well as the reluctance by organisations to transition to be the most pressing impediments to transitioning towards a circular economy. According to Kirchherr et al. (2018), intervention through policy could enable coordinated efforts in industry which would then eliminate these obstacles. Kirchherr et al. (2018) also mentioned market barriers such as the high upfront investment of changing to a circular business model as well as higher price tag of circular raw materials.

Maione et al. (2022) investigated the development of the transition to a CE within the plastic packaging industry by interviewing various players along its value chain in a case study done in Italy. An established legislative context and technical solutions had driven most industry players towards plastic recovery as the prevalent approach to the CE. Maione et al.'s (2022) findings revealed that the transition was happening at varied pace

and stages across the supply chain, although acknowledging a move towards a more systemic process of incorporating upstream and downstream strategies in an integrative manner. Maione et al. (2022) found that companies had varying interpretations of the CE such that the approaches towards the transition were diverse. According to Maione et al. (2022), these challenges could be overcome by centralised prioritisation and greater levels of collaboration. Maione et al. (2022) further added that the country level and global legislation needed to be synchronised across the supply chain.

2.8.2 Analysis of Barriers Literature

Maione et al.'s (2022) findings confirmed Kirchherr et al.'s (2018) assertion that legislative frameworks were a key enabler to the transition. They found that an established legislative context had driven actions of the plastic packaging value chain actors towards a specific CE strategy which facilitated a more systematic and integrated approach.

Kirchherr at al. (2018) further highlighted the high upfront investment cost and higher prices of circular product alternatives as a barrier. Maione et al.'s (2022) case study found the root cause to these barriers that different understanding and focus by various companies led to firm's implementing different CE strategies. This discord generates niche solutions within the same sector and thus delays the benefit of scale economies.

2.8.3 Description of Enablers in Literature

Batista et al. (2018) postulated that the fundamentally different nature of a CE compared to sustainable supply chain management, a transition from linear to circular supply chains required an organizational mindset shift to abandon current linear practices and develop circular business models.

Korhonen et al. (2018) and Hofmann (2019) concurred with Batista et al. (2018) that a transition towards CE was a major transformation for a firm. Korhonen et al. (2018) further defined this a paradigm shift with two interdependent stages. The first stage is described as a change of mindset, culture shift which informs formalised policies an guidelines, whilst the second stage is the systematic and practical implementation (Korhonen et al., 2018).

Hussain and Malik's (2020) study emphasised the role of the organizational culture and mindset in enabling the transition to CE. They conceptualised an organisations inclination towards sustainability as the awareness and mindset of employees that informs their actions regarding sustainability activities (similarly towards CE). Hussain and Malik (2020) concluded that a convincing organisational rhetoric was a key enabler

of the transition towards a CE and affected both the supply chain collaborations towards a CE and the desired CE objective of better environmental performance.

Tura et al. (2019) observed that the staff members' awareness about sustainability and a greater understanding of the economic benefits of a CE promoted a transition to CSCs.

2.8.4 Analysis of Enablers Literature

The organisational mindset shift was widely supported as a fundamental first step to enable a company to transition towards a CE (Batista et al., 2018; Hussain & Malik, 2020; Korhonen et al., 2018). The fundamentally different nature of a CE compared to other sustainability frameworks demands changes at the core of an organisation's culture to switch and thus create a willingness to redesign the business model and make the necessary investments to implement CE strategies.

Hussain and Malik (2020) concluded that a convincing organisational rhetoric was a key enabler of the transition towards a CE and affected both the supply chain collaborations towards a CE and the desired CE objective of better environmental performance. This was supported by Tura et al.'s (2019) observations that the staff members' awareness about sustainability and a greater understanding of the economic benefits of a CE promoted a transition to CSCs. The company vision and strategy rhetoric cement the understanding and awareness amongst its employees. Understanding the economic benefits enabled the justification of the business case to overcome the barriers of high initial investment costs that may be required.

2.8.5 Concluding remarks on Barriers and Enablers to Transition

The key barriers highlighted in the extant literature were the lack of legislative or regulatory frameworks to guide coordinated efforts as well as the high upfront investment costs required to implement CE strategies. In addition, circular products were also considered to be niche and more expensive.

The enablers discussed in extant literature are the drastic shift in the organisation mindset vision and strategy and how this was communicated to employees. The transition required a change in business model, activities and organisation boundaries accompanied by significant financial investments therefore identifying the economic benefits was also a key enabler.

This research sought to gain a deeper understanding of the challenges and barriers to the transition towards a CE as well as what practitioners considered to enable them to

implement CE strategies.

2.9 Review of CE contribution to Sustainable Outcomes

2.9.1 Description of CE Contribution to Sustainable Outcomes

According to Genovese et al. (2017), green and sustainable supply chain management practices have been widely adopted in the last ten to twenty years. These were aimed at reducing the negative impacts of production and consumption patterns by integrating environmental practices into business activities. The circular economy reaches beyond lessening the negative impacts on the environment to the design of sustainable production systems in which resources and energy circulate in the system indefinitely (Genovese et al., 2017).

Sudusinghe and Seuring (2022) postulated that the shift from traditional supply chains to circular supply chains (CSCs) in line with the development of the circular economy enabled organisations to enhance their sustainability performance. They found that in terms of sustainability outcomes, the attention of CSCs was on environmental preservation and economic performance with very little attention to the social aspects. For instance, they did not find any CE studies examining only the social dimension under supply chain collaboration in the CE context. Sudusinghe and Seuring (2022) established that the most debated topics under sustainability outcomes were mainly environmental (e.g., waste management 75%, emissions 70%), followed by economic (e.g., profitability 73%), and lastly social (skills development only 39%). It seemed that the motivation to address social issues in circular operations was promoted by parties external to the focal firms. These findings illustrated that the social sustainability dialogue was still limited in the CE context.

Veleva and Bodkin (2018) found that the increasing attention to localise sourcing, sustainability pledges by companies, zero waste targets by businesses and cities as well as public perception, were driving organisations to desire embarking on a transition towards a CE. The lack of regulation and incentives was a barrier for large corporates as they considered the investment required to change their business models. Veleva and Bodkin (2018) found that entrepreneurial companies who were enthusiastic about environmental sustainability were discovering the market gaps presented by the CE. The CE had thus created an opportunity for collaboration between corporates and entrepreneurial firms to combine their complementary capabilities in implementing circular business models.

Veleva and Bodkin (2018) argued that the CE could facilitate social outcomes like creating employment, education and training opportunities, unlocking access for

previously disadvantaged communities and promoting social equity. According to Veleva and Bodkin's (2018) findings, entrepreneurs were well-placed to deliver this social value, which was an area that was currently neglected in the extant literature.

Hussain and Malik (2020) postulated that the relationship between the circular economy and sustainability concepts in the context of supply chains may be mutually constitutive. They argued that although the CE intersected with sustainable supply chain management (SSCM), SSCM had incremental impact on sustainability whereas a transition from linear to circular supply chains required revolutionary changes to the business model that were aimed at achieving sustainability outcomes. Hussain and Malik (2020) concluded that a convincing organisational rhetoric was a key enabler of the transition towards a CE and affected both the supply chain collaborations towards a CE and the desired CE objective of better environmental performance.

2.9.2 Analysis of CE Contribution to Sustainable Outcomes

A move from traditional supply chains to Green supply chains (GSC), Sustainable supply chains (SSC) and circular supply chains (CSCs) enabled organisations to enhance their sustainability performance (Genovese et al., 2017; Hussain & Malik, 2020; Sudusinghe & Seuring, 2022; Veleva & Bodkin, 2018). Genovese et al. (2017) further emphasised that the circular economy reaches beyond lessening the negative impacts on the environment to the design of sustainable production systems in which resources and energy circulate in the system indefinitely. This was supported by Hussain and Malik (2020) who argued that although the CE intersected with sustainable supply chain management (SSCM), SSCM had incremental impact on sustainability whereas a transition from linear to circular supply chains required revolutionary changes to the business model that were aimed at achieving sustainability outcomes.

Both Sudusinghe and Seuring (2022) and Veleva and Bodkin (2018) found that in terms of sustainability outcomes, the attention of CE studies and CSCs was on environmental preservation and economic performance with very little attention to the social aspects. Veleva and Bodkin (2018) argued that, through supply chain collaborations between large firms and entrepreneurial firms, the CE could facilitate social outcomes like creating employment, education and training opportunities, unlocking access for previously disadvantaged communities, and promoting social equity. Sudusinghe and Seuring (2022) concurred the role of smaller firms in the supply chain, stating that the motivation to address social issues in circular operations was promoted by parties external to the focal firms.

2.9.3 Concluding remarks on CE Contribution to Sustainable Outcomes

There was consensus amongst scholars that the CE is a step up from other paradigms like SSC and GSC in terms of its potential contribution to sustainable outcomes. By its definition the contribution to economic and environmental outcomes is inherent, hence these have been the main focus of various studies on these two pillars of sustainability in CE outcomes. This research sought to gain insights into how the transition to a circular economy contributes to sustainable outcomes, in particular the social outcomes.

2.10 Conclusion

This chapter reviewed the literature on the circular economy, circular business models, sustainable/circular supply chains to set the context. Thereafter the extant literature on the key constructs of the research question supply chain collaboration, partner selection, relationship management, barriers and enablers of the transition and the sustainable development outcomes was reviewed.

The literature review revealed that although the topic of circular economy had gained a lot of attention from academia, scholars and governments, there were some inconsistencies in the understanding of the concepts stemming from its multidisciplinary nature. The transition to a circular economy requires a major paradigm shift that can only be achieved through transformation of business models. Hence the role of supply chain collaboration were considered a key enabler of the transition.

This is why gaining a deeper understanding on how supply chin collaborations support the transition is important for business and academia, hence the invitation for further research.

The literature review indicated there was a relationship between the partner selection processes, partner capabilities and the relationship management mechanisms on the outcomes of the collaborations. A deeper understanding of these constructs was therefore required in filling the research gap. In addition, the CE''s contribution to sustainable development goals required to be understood to enable organisations to align their CE transition with their sustainability goals for a greater impact on the global ecosystem.

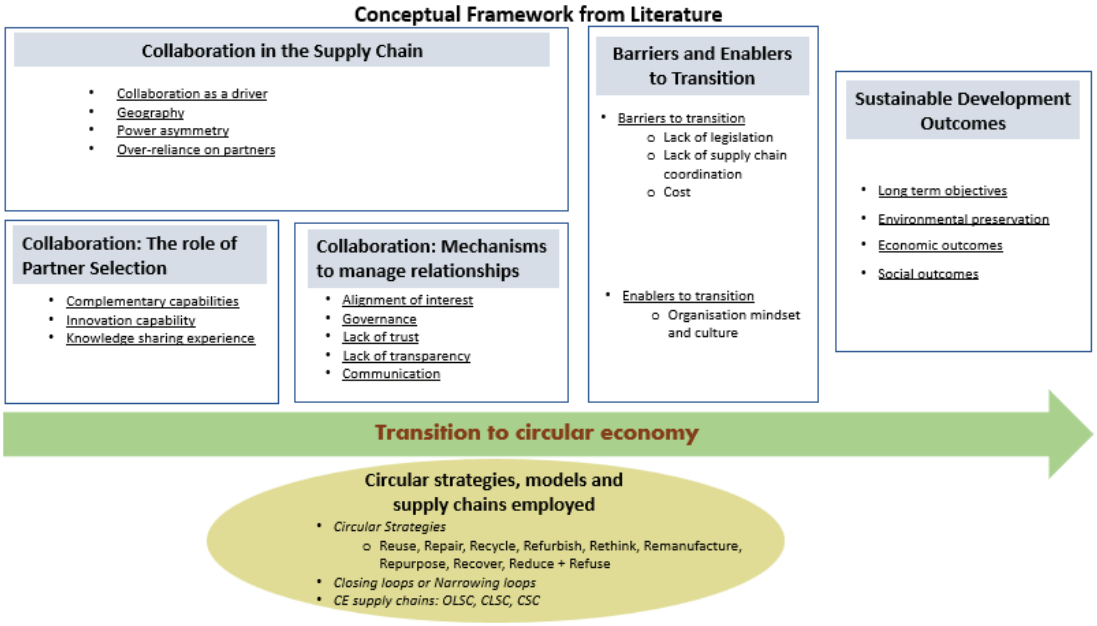
2.11 Conceptual Framework

The literature reviewed in this chapter identified the key constructs and themes that were relevant for a deeper understanding of the topic and what was already known about in in literature. The key constructs identified were supply chain collaboration, partner selection, relationship management, barriers and enablers of the transition and

sustainable development outcomes. In concluding this chapter, these key constructs and the themes discussed in the extant literature were incorporated into the conceptual framework as illustrated in

Figure 3.

Figure 3: Conceptual Framework from the Literature



3. CHAPTER 3: RESEARCH QUESTIONS

The purpose of this chapter is to present the research questions by defining the academic focus of the research in line with the research problems and research questions posed in Chapter 1.

The research questions stem from the literature reviewed on the topic as presented in Chapter 2. The literature review focused on four key constructs in the context of a transition to a circular economy such as supply chain collaboration, partner selection, mechanisms for managing the relationships and the sustainable development outcomes. There were research gaps identified in the literature regarding the main topic which informed the research questions and the sub-questions. The main research question looked to build on Berardi and de Brito's (2021) invitation for future research in their conclusion that "New projects and studies need to investigate collaboration in supply chains in more depth in order to ascertain not only the evolution of the CE, but also its contributions to sustainable development." (p. 8). The main research question formulated from this invitation was:

How does supply chain collaboration drive the transition to a circular economy and its contributions to sustainable development outcomes?

In the analysis of the literature related to the topic, further propositions and research gaps were identified such as the need to have a better understanding of the role of partner selection and partner capabilities in supply chain collaboration and to further explore what were the mechanisms used to manage the collaborative relationships. These served to develop the sub-questions required to gain deeper insights on the main topic.

Research Question 1: What is the role of supply chain collaboration in the transition towards a circular economy?

The research sought to understand the role of supply chain collaborations in the transition to a circular economy whilst gaining insights into how the transition to a circular economy was driven through the activities of organisations participating in supply chain collaborations and the impact of the supply chain dynamics. It was important to gain better understanding from the experiences of the actors such that these insights could be used to eliminate collaboration barriers and accelerate the transition.

Research sub-question 1: What role do partner selection and partner capabilities

play in the supply chain collaboration for transition to circular economy?

This sub-question was designed to better understand how supply chain partners were selected and what was the role of the partners capabilities in the selection as well as in the success of the collaboration. The insights based on the experience of the actors who had been involved in these processes would serve to provide a framework for others and improve the probabilities of success.

Research sub-question 2: What mechanisms are used to manage collaborative relationships in the supply chain collaborations?

This sub-question was designed to gain a deeper understanding of how the relationship management mechanisms impacted the outcomes of the collaboration. The insights based on the experience of the actors would provide a framework to identify priority areas and to navigate the pitfalls.

Research sub-question 3: What are the barriers and enablers to transition towards a circular economy?

This question was designed to understand the enabling and the limiting factors for organisations to transition towards a CE as these impact on the availability of supply chain partners to collaborate with as well as the speed of transition.

Research Question 2 - How does the transition to a circular economy lead to sustainable development outcomes?

The aim of this research questions was to gain a deeper understanding of the impact of the circular economy on achieving sustainable outcomes. Various scholars had cited that inherent in the CE definitions was a bias towards the two pillars of sustainability and hence in terms of outcomes the contribution to sovial outcomes had been neglected (Geissdoerfer et al., 2017; Kirchherr et al., 2017; Sudusinghe & Seuring, 2022; Veleva & Bodkin, 2018). Therefore, deeper understanding of how the CE contributed to sustainable development outcomes was significant for organisations embarking on the transition or making the decision to transform their business models for sustainability in order to have a clearer understanding of how this aligns with achieving other sustainability goals.

4. CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

This chapter discusses the research design and methodology for the research that was conducted. A research design is a basis for creating data in a way that fits particular standards and conditions but that is also appropriate to address the research question being considered.

4.2 Choice of Methodology

4.2.1 Type of Research Question

The research questions were derived from the literature review which recommended further study into how supply chain collaborations drive the transition towards a circular economy and its contribution to sustainable development outcomes. The literature review further informed the sub-questions required to unpack the main research question such as how the collaborations are formed as well as what mechanisms were used for managing the collaborations. The research study was an exploratory study as it sought to explore how supply chain collaborations drive the transition to a CE as well as the related sub-questions to this main research question. According to Braun and Clarke (2006), broad research questions seeking to answer the “how’’, “why” or “what” of a phenomenon are exploratory. Therefore, an exploratory study was appropriate to answer the research question and the related sub-questions.

4.2.2 Research Paradigm

The research paradigms that were considered, which are useful for business research (Bell et al., 2018), were the positivist and the interpretivist approaches. Positivism is described as focused on gathering measurable and factual data (Bell et al., 2018; Eisenhardt et al., 2016). According to Bell et al. (2018) positivism aims to explain human behaviour, whereas interpretivism is focused on gaining insights into human behaviour. The positivist approach was considered to be incompatible with exploratory research aimed at gathering the experiences of participants to gain insights and understanding. Bell et al. (2018) further explained that interpretivism is appropriate for addressing the ‘how’ and the ‘why’ of people’s activities and their experiences and how they interpret those experiences. The exploratory nature of the research question and the aims of the research to gain deeper knowledge of the respective practitioners’ experiences in supply chain collaborations for a circular economy through non-numeric data, justifies the choice of an interpretive paradigm.

Interpretivism acknowledges the value of different perspectives, which matches the research question that sought to explore diverse perspectives. The underlying assumptions about how one goes about gaining insight into behaviour (i.e. the supply chain collaboration) is an interpretive epistemology (Gehman et al., 2018). The subject of supply chain collaboration towards a circular economy was still at a conceptual stage of development, in this case exploratory methods were most appropriate.

The underlying assumptions about how one goes about gaining insight into behaviour (i.e. the dynamics of collaboration) is an interpretive epistemology (Gehman et al., 2018). Based on the literature review by Hina et al. (2022), most of what has been gathered on the subject by scholars has been based on qualitative studies (67%), through interviews and case studies. Therefore, given how scholars know what is currently known has been gathered through an interpretive paradigm, the selected interpretivism epistemology was appropriate for this study (Creswell, 2007). The context of the invitation or research question as stated by Berardi and de Brito (2021), was worded as an exploratory study hence the selection of an interpretive research paradigm.

4.2.3 Underlying assumptions of the Intepretive Paradigm

A research paradigm is informed by the assumptions about its ontology (nature of reality) and epistemology (nature of knowledge). The selected research paradigm, interpretive, has as its underlying ontological assumptions, i.e. the nature of reality or the subject matter to be studied, that reality is socially constructed i.e. it was derived from how people act or make sense of the world (Bell et al, 2018). This implies a subjective sense of reality. The underlying epistemological assumption for interpretive paradigm is that the understanding of human behaviour is derived from the meaning that people attach to their experiences (Al-Ababneh, 2020; Bell et al., 2018).

The research question as gathered from Berardi and de Brito's (2021) invitation sought to explore and gain deeper insights into how supply chain collaboration facilitates the transition to CE and its contribution to sustainable development. This is a "how" question and is therefore an exploratory question.

According to Bell et al. (2018), the starting point in the choice of methodology is the assumptions about the ontology or nature of the subject. In this case, the proposed research is to better understand the essence of the supply chain collaboration phenomenon, by examining the views of individuals who have experienced it. The ontological assumptions about the nature of the phenomenon that was studied was that it was socially constructed i.e. derived from how people act or make sense of the world.

The research questions were concerned with people's experiences in supply chain collaboration, which fit the epistemology of the selected paradigm. The research sought to get a deep understanding of the lived experience of individuals in supply chain collaboration towards a circular economy. Therefore, the answers to the questions were expected to present a subjective perspective, representative of their specific experiences. This epistemology was considered appropriate for this research to study a phenomenon as it was experienced by individuals (Bell et al., 2018). The underlying assumptions of the selected paradigm suit the exploratory nature of the question which requires having diverse perspectives that would be valuable to gain deeper insights.

4.2.4 Research Strategy

A qualitative study method was selected since the research sought to collect non-numeric data in the form of words (Bell et al., 2018), about the subjects' experiences in how supply chain collaborations drive the transition to a CE. According to (Sofaer, 1999) qualitative methods are useful for gaining insights into the experience of various stakeholders with different roles and how they interpret those experiences. Furthermore, Sofaer (1999) argued that qualitative methods are best suited for explorations of concepts towards the development of theories. Braun and Clarke (2006) identified that qualitative methods were best suited for an exploratory study and for answering 'how' questions. The subject matter to be addressed by the research questions is at a conceptual stage, with one of the aims of the research was to develop a conceptual model. In addition, based on the research question being exploratory and aiming to answer the 'how' and 'what', the choice of a qualitative study was suitable for this research.

4.3 Population/Setting

Bell et al. (2018) defined a population as the broad pool from which a researcher may pick a sample (i.e., a subset of units to be part of the research). Bell et al. (2018) further describe probabilistic sampling as random sampling which is utilised when the objective is to select a representative sample such that the results can be generalised to the population, and non-probabilistic sampling which is not random selection such that some units are strategically targeted to form part of the subset. Non-probabilistic sampling was selected for this research as it had been determined that rich insights and new understanding could be derived from a specific group of diverse individuals who have experienced supply chain collaborations and would be able to share that experience and their understanding to answer the exploratory research questions. As discussed in the preceding section, the interpretive research paradigm selected assumes that the

answers to the research questions were expected to be subjective and reflect the specific experiences of the participants, therefore non-probabilistic sampling was considered appropriate.

The research setting/population are people who would be able to answer the research questions, for this research the setting was defined as large corporates or brand owners and their supply chain partners operating in South Africa who have experience in or are currently involved in supply chain collaborations aimed at implementing circular economy strategies or transitioning towards a circular economy. The targeted groups of participants were: Fast-Moving Consumer Goods (large multinational brand owners), Packaging Manufacturers (FMCG supply chain), Mining sector and Circular Economy Consultants (clientele in diverse sectors). However, due to challenges with lack of access and availability from the Mining sector, this group was supplemented with Heavy industry which included Construction and Water Services. These participants still met the sample criteria which was sector agnostic.

The four participant groups were designed to facilitate data triangulation through comparing the research findings (both in-case and cross-case) from each group based on the key differences identified as illustrated in Table 3 below.

Table 3: Categorisation of the participant groups

Participant Group	Role in the supply chain	Customer	CE strategies	Stage of CE transition
FMCG	Lead firm	End consumer	Diverse	Advanced
Packaging Manufacturers	Downstream supplier	Business-to business	Recycle, Reuse	Advanced
Mining and Heavy Industry	Lead firm	Business and end consumers	Diverse	Early
Circular Economy Consultants	Across the supply chain	Advisory	Diverse	Varied

The target setting was therefore the actors in the supply chain collaboration for a circular economy in South Africa. Individuals who work in the entities that are involved in or transitioning to circularity and were involved in its supply chain collaborations were considered able to bring insights of their experiences in the subject matter.

4.4 Level and Unit of analysis

The level of analysis was determined at a construct level, in this case collaboration was done by supply chain partners, who are organisations, therefore the level of analysis was

the organisation. The research gap identified by Berardi and de Brito (2021) was on how supply chain collaborations drive the transition to a CE, these collaborations were done by organisations in those supply chains. The sub-questions were also concerned with how the collaborative relationships were formed and managed. Similarly, it is organisations who are involved in those interactions. Therefore, the organisational level of analysis was selected in addressing the main research question and the sub-questions.

The unit of analysis is determined by the research design, i.e., how the data is to be collected. Gaining insight into the supply chain collaboration phenomenon was done through interviewing individuals who had experienced it. The unit of analysis was each individual (i.e. senior managers or decision makers involved in supply chain collaboration for a CE as per defined sampling criteria) who shared their experience of the phenomenon, through the semi-structured interviews.

4.5 Sampling

The interpretive paradigm selected for this research required diversity of perspectives, hence the sampling strategy ensured diverse groups of participants, which also meets the research aims to seek new insights and understanding.

According to Bell et al. (2018), purposive sampling is best suited for qualitative studies. This is a non-probabilistic sampling technique that strategically targets participants in the research setting to answer specific research questions (Bell et al., 2018). This was a qualitative study and purposive sampling was also appropriate to gather deep insights and understanding form those who had the experience as required by the research question. The purposive sample criteria were strategically defined to recruit participants who could give insights on the research questions. For this study purposive sampling was applied by identifying three selection criteria. The three main criteria used to select participants were:

1) The targeted sectors were the fast-moving consumer goods (FMCG), packaging, mining and heavy industry and circular economy consultants. These industries were selected because of the diversity of experiences of the transition to a CE as described in section 4.3. The FMCG and packaging sector face a lot of challenges when it comes to circularity and the sustainability of packaging materials, therefore this has significant business relevance. The mining and heavy industries have also received a lot of attention due to their slow progress in transitioning to a CE and the large impact these sectors have on the economy and on the achievement of the SDGs. Lastly, the CE consultants' group were selected due to the diversity of experiences

this group would have due to their involvement with a wider range of sectors in their advisory roles. These factors allowed for rigour in the data triangulation and cross-case analysis of the research findings.

2) Organisations within the selected groups that work in South Africa and are collaborating in their supply chains. The reason for the selection of South African companies was for the ease of accessibility for the interviews (data gathering), the criteria of collaboration towards a circular economy was to match the research question which sought insights into supply chain collaboration in the transition to a circular economy.
3) Participants had to be senior managers who are involved in the CE transition strategy or responsible for the decision making in the supply chain collaborations for a CE at the selected firms, to ensure they had lived experience of the phenomenon being explored.

The above three criteria ensured selection of participants who could share realistic information about their experience in supply chain collaboration for a transition to a CE. Potential participants were first identified through perusing the sustainability reports of listed FMCG, packaging and mining companies to identify those that mentioned collaboration towards circularity or sustainability. Secondly, companies who were members of the UN Global Compact (SA chapter), Plastics Pact SA, African Circular Economy Network as well as the Ellen MacArthur Foundation were also considered as these memberships indicated that the organisations were involved in collaborative relationships towards creating a circular economy. Once the companies were identified, participants were recruited through the researcher's personal, academic and professional networks.

The diversity of the groups of participants ensured sampling rigour. The risk with purposive sampling is that it could lead to a homogeneous sample. The researcher therefore paid particular attention to ensure that whilst this was a targeted approach, there was in-group and cross-group diversity in the sample to achieve the diversity of experiences that is critical for an exploratory study.

The sectors selected had companies who were at various stages of transitioning to a circular economy. The population included lead firms who had a mix food and/or beverage products, consumer goods to be packaged in a range of packaging materials including plastic, paper, glass or metal. The packaging manufacturers were organisations who supplied various types of packaging materials (plastic, paper, metal lor composite) including sustainable packaging to the FMCG, Food and Beverage, Fast Foods and retails markets. The target was to include lead firm participants and at least

two of its supply chain partners as participants. However, this was only achieved for the FMCG group (supply chain partners being the Packaging Manufacturers). The supply chain partners provided a different perspective of the supply chain collaboration experience (lead firm vs. downstream supplier), which also adds to the sample rigour and data triangulation.

The mining and heavy industry consisted of firm who could provide the lead firm perspective, however there was diversity in the circular economy initiative and the supply chain collaboration experiences. The circular economy consultants group served to triangulate the lead firm and supplier perspective with a holistic view of the collaborations from a coordinating perspective. These categories allowed for data to be triangulated which was particularly important as purposive sampling could lead to homogeneous data. The variety of experiences and perspectives were required to address the exploratory research questions as this add to a deeper understanding of the topic.

4.5.1 Sample size

The target sample size that was considered appropriate with the available time for data collection was 18 participants, with a minimum of 12 participants considered as adequate to provide a diversity of perspectives and new insights into the research topic. In the end 18 participants were interviewed, which assisted with the depth of perspectives and allowed triangulation of the research findings from the four participant groups.

Once the targeted organisations within the strategically targeted groups were identified, participants were selected from the researcher's existing professional network, the professional network developed through the GIBS MBA and MPhil cohorts, and some were some sought through searches of the relevant organisations on LinkedIn. Some participants were secured through the snowball effect from referrals from some of the interviewees professional networks. The sampling criteria were adhered to in all referrals. Research participants were selected on the basis of a heterogeneous sample to enhance sampling rigour.

All potential participants were invited via an email (or LinkedIn inmail) introducing the research topic, where applicable stating who had referred them as a potential participant and the reason the researcher believed they could provide valuable insights into the topic. The researcher kept track of the dates when emails were sent and followed up consistently by sending reminders where there had been no responses. All the participants in the sample had senior management and or decision-making responsibilities with respect to supply chain collaboration in their organisations. The list of actual participants by group and their roles in their organisations are presented in

Table 4 below.

Table 4: Actual Participants who were interviewed

	Participant	Participant Group	Role in the organisation
1	FMCBV1	FMCG	Sustainability Manager
2	FMCBV2	FMCG	Sustainability Manager
3	FMCBV3	FMCG	Head: Corporate Affairs
4	FMCBV4	FMCG	Sustainability Manager
5	FMVAR1	FMCG	Sustainability Manager
6	FMVAR2	FMCG	Head of Sustainability
7	PLSMN1	Packaging Manufacturer	Executive Director
8	PLSMN2	Packaging Manufacturer	Executive Director
9	PLSMN3	Packaging Manufacturer	Head of Packaging
10	CONCE1	Circular Economy Consultant	Executive
11	CONCE2	Circular Economy Consultant	Executive
12	CONCE3	Circular Economy Consultant	Executive
13	CONCE4	Circular Economy Consultant	Executive
14	CONCE5	Circular Economy Consultant	National Head
15	OTMIN1	Mining and Heavy Industry	Senior Engineer
16	OTMIN2	Mining and Heavy Industry	Project Lead
17	OTCOX	Mining and Heavy Industry	Executive
18	OTWAT	Mining and Heavy Industry	Environmental Manager

Source: Researcher's own

The table above shows the final list of participants who were interviewed through the semi-structured interviews. Six participants were from the FMCG companies, three from the packaging manufacturing companies, five were circular economy consultants and lastly, four were from the mining and heavy industry. The participant names have been anonymised by creating codes that protect the identity of each participant and their organisation to comply with the ethical considerations the undertakings on the informed consent forms that were signed.

4.6 Research instrument

The research was conducted through semi-structured interviews of the participants who met the sampling criteria. According to Bell et al. (2018), interviews are widely used data gathering mechanisms for both qualitative and quantitative research. To eliminate

influencing the responses through variation of how the questions were asked, a research protocol was designed. The research instrument or interview protocol was designed with a set of open-ended questions to be used to give structure to the conversation with the research participants. Semi-structured interviews allow researchers to ensure the interview execution is consistent and this improves the reliability of the data gathered (Bell et al., 2019). The research instrument used for this research is presented in Table 5 below.

Table 5: Research Instrument - Interview Protocol

Kick-off question	Can you please tell me how you got involved in sustainability?
Q1	What are your expectations and expected outcomes that, based on your experience, you are hoping to achieve from the sustainability initiative(s)?
Q2 *Research Question 1 What is the role of supply chain collaboration in the transition towards a circular economy*	Please can you tell me about your experience of how supply chain collaboration drives sustainability or sustainable outcomes?
Q3 *Research SubQuestion1: What role do partner selection and partner capabilities play in the supply chain collaborations?*	This is a good point to move into my next question, and this next question has two parts. The first part is, please could you tell me, what your experience has been on what is the role of partner selection in achieving the expected outcomes? Secondly, linked to that, please tell me what you have experienced to be the role of partner capabilities in achieving the expected outcomes?
Q4 *Research SubQuestion2: What mechanisms are used to manage collaborative relationships in the supply chain collaborations?*	In your experience, how do you manage the collaborative relationships and what are the key ways that you do this?
Q5 *Research*	Please tell me, in your experience, what other mechanisms, tools, processes and so forth are used to manage the collaborative relationships?

SubQuestion2: What mechanisms are used to manage collaborative relationships in the supply chain collaborations?	
Q6 *Research SubQuestion3: What are the barriers and enablers to collaborating for transition towards a circular economy?*	My next question again has two parts to it: Firstly, what, in your experience have been the key challenges in collaborating towards sustainability in your supply chains? And secondly, linked to that, what has enabled you to overcome these challenges or what have you done, and continue to do, to overcome the challenges?
Q7 *RQ2 - How does the transition to a circular economy lead to sustainable development?*	I am now going to move to my next question which I will ask in two parts, the first part is as follows: 7.1 What are the outcomes that you have you achieved so far? And the second part to that question is: 7.2 Could you consider, whether and to what extent these outcomes may be described as circular or could lead to a circular economy?
Closing question	To close off the interview, could you tell me how you see this developing into the future?
Further Questions	The following questions may be asked as and when required during the interview 1) Probing questions: a) I wonder if you could tell me more about that? b) I wonder if you could give me an example to illustrate that? 2) Clarification question: a) Could you clarify what "…." means?

Source: Researcher's own

The research instrument was designed according to Josselson (2013) with a little question to kick-off the interview and a little question for closing. The opening question served two purposes, firstly to qualify the selection of the participant by confirming that they did indeed work in the relevant field for the research topic and secondly, it allowed the participant to talk about themselves and thus relaxed the participant and settled both the participant and interviewer into the interview.

The interview protocol consisted of six big questions that addressed the research questions and the sub-questions. The set of questions were not academic and designed to use everyday language but were constructed to be able to provide the data to answer the research questions. The actual research questions in the academic language as stated in Chapter 3 are inserted alongside the interview questions to indicate which research question each of the big questions were addressing. The term circular economy was avoided as it had been established through the literature review the varying definition as and levels of understanding of the term in business. The term sustainability is more commonly used by practitioners to refer to circular economy strategies or principles. The aim of using common everyday language was to maintain that consistency of context for all participants who may have had varying levels of understanding or interpretation of the term. The relevance of the initiatives to a circular economy were apparent in the examples shared. Further, the second part of the last big question provide the opportunity for the participants to confirm their understanding of a circular economy.

Careful attention was paid to the design of the interview protocol to preserve data quality and ensure common understanding or context amongst the participants. The estimated duration for each interview was 45 minutes to an hour. The instrument could not be tested prior to the ethical clearance process therefore the first interview served to test if there were any modifications required on the research instrument, however it went smoothly, and that interview was therefore used as part of the research data set.

Having an interview protocol standardised the data gathering process. Another key element to preserve data quality was to ensure that the questions were open ended and there were no leading questions (Josselson, 2013). The interview protocol also included a list of probing questions that could be used that were also designed to encourage the participant to say more, without leading them in a particular response. Josselson (2013) guards against some interview pitfalls such as the interviewer making (positive or negative) judgemental responses that may have the effect of leading. These were avoided during the data gathering. This is very important for an exploratory study such as was done for this research to maintain subjectivity whilst gaining extensive understanding of the participants' experiences and their own interpretations of them as guided by the interpretive research paradigm selected.

The closing question was designed to be deliberately vague and exploratory; this was done to allow the participant to connect it to what they thought was important to add. Further, this provided an opportunity for the participant to mention or clarify anything else

they may not have already covered but thought was relevant to the topic. Open ended questions suit this type of exploratory study by leaving it to participant to interpret in their own meaning without the researcher leading them to a specific answer. This was well in line with the selected interpretivist paradigm for this research.

4.7 Data gathering process

The data collection was done only through semi-structured using an interview protocol (research instrument) as presented in Table 5 above (also see APPENDIX B). The ethical clearance approval by the GIBS Research Ethics Committee was obtained on 22 July 2020 (see APPENDIX C), following which the data gathering process commenced on the 15th August 2022. The average length of the interviews was 41 minutes, with the shortest interview being 27 minutes and the longest interview taking 92 minutes. In total, 18 interviews were conducted as part of the data gathering process for this research.

All the participants were required to and agreed to sign an informed consent form (see APPENDIX D for proforma) prior to commencing with the interviews. The informed consent form was sent to each participant via email at least two days prior to the scheduled interview and they were requested to familiarise themselves with its contents. This served to save time at the beginning of the scheduled interview where the informed consent form was explained and signed, most participants were already familiar with its contents and were happy to sign it. Secondly, the emailing of the informed consent served as a reminder and confirmation of the interview appointment, some of which were scheduled well in advance.

An interpretivist approach to data gathering allows participants to communicate their experiences and interpretations using their own words (Bell at al., 2018). The research instrument (Table 5) which was designed with open-ended questions that was used for the data gathering in this research enabled the research participants to openly express their lived experience and understanding of supply chain collaborations for a CE.

All the interviews were conducted virtually using video conferencing software called “Microsoft Teams” and “WhatsApp” video teleconferencing. Virtual meetings have become the norm since the Covid-19 pandemic which restricted face-to-face meetings. The use of virtual platforms improved access to participants who resided in other provinces that were far from the researcher. In addition, this greatly improved availability and flexibility as no travel time needed to be incorporated into the interviewer or the

participants schedules, therefore rescheduling within a few hours was possible and often to a timeslot on the same scheduled date. These observations were in line with Bell et al.'s (2018) observations about non-face-to-face interviews with reference to the "Skype" software platform.

The data collection process was guided by Josselson (2013) on conducting interviews for qualitative enquiry. To maintain the relational element of the interviews, the researcher insisted on keeping the video cameras of the teleconferencing software on for the duration of the interview. This ensured that the researcher could maintain eye contact with the participants as well as be able to see body language cues to be able to implement the interviewing techniques suggested by Josselson (2013) such as whether the participants was pausing to think or needed further prompting or a few second of silence to encourage prompt them to continue talking.

The consent included agreement to having the interviews recorded and transcribed for data analysis. The interviews were recorded using the teleconferencing software recording function. A back-up recording was made with the interviewer's cellular telephone voice recorder.

4.8 Data preparation

Once each interview was completed, the audio files were downloaded and sent to professional transcribers for transcription. In line with the ethical undertakings as outlined in the informed consent form, each transcriber was required to sign a non-disclosure agreement prior to any audio files being sent to them. A proforma transcribers non-disclosure agreement is attached in APPENDIX E. Two professional transcribers were used to transcription services.

On receipt of each transcript, the researcher would again listen to the audio recordings whilst reading the transcript to correct any errors based on the audio files. Bell et al. (2018) recommends prompt transcription of the interviews enhances the validity of the data; therefore, the transcribing was done as soon as possible after the interviews were conducted. This also assisted with recollection in reviewing the transcript as the information was still fresh. The researcher would thereafter read through the transcript once more this time with the aim of anonymising and removing and identifying data in the transcripts. This process, and the interview itself, served to familiarise the researcher with the data gathered. This was the first step of the thematic analysis as recommended by Braun and Clarke (2006).

4.9 Ethical considerations

Each participant was required to sign an informed consent form prior to commencing the interview. The interviews were audio recorded and professionally transcribed. In the informed consent forms the participants granted authorisation to the audio recording, transcribing, data storage and the dissemination of the research report. A proforma informed consent form is attached in APPENDIX D.

The data was stored and reported with no identifiers of the participants or their organisations. The sampling criteria fit a population of several entities involved in supply chain collaboration therefore the broad nature served to ensure the participants or their organisation were not identifiable by virtue of the description of the setting. The nature of exploratory research requires diversity of participants and not any particular organisation therefore no organisational consent was required. As per GIBS requirements, the data collected will be stored in an electronic format on the researcher's personal cloud storage for a minimum period of ten years.

4.10 Data analysis approach

The analysis method followed steps suggested by Braun and Clarke (2006) wherein the researcher familiarized themselves with the data by reading the transcripts whilst listening to the audio recordings of the semi-structured interviews and editing as well as removing any identifying mentions to anonymize the data collected. Based on the exploratory and qualitative nature of the study, (Bell et al., 2018) recommend an inductive approach as the appropriate analytical approach. This was suited to the research questions that sought to gain new understanding based on the participants' unique experiences.

The recommended process is a combination of the inductive method described by Braun and Clarke (2021) for the first order codes and switching to deductive method using a theoretical lens as described by Klag and Langley (2013). First level coding creates short phrases using the participants' language i.e., "units of meaning" from the participants quotations. Second level coding groups the first level codes into first order categories. It was at this stage that a deductive analysis was then utilized using a conceptual lens or framework (Klag & Langley, 2013). The deductive step suited qualitative nature of the research to deduce theoretical meaning from the participants individual experiences.

The transcripts from the 18 interviews were uploaded onto Atlas.ti (a data analysis software tool). The data analysis followed a 4-step coding process (outlined in Figure 4),

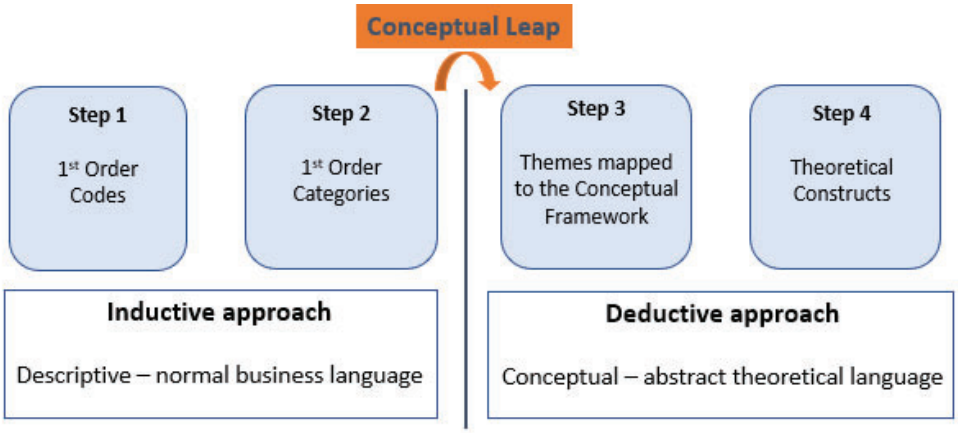
starting with first level coding of the interview transcripts in Atlas.ti using an inductive process for the initial analysis. The researcher started the coding process by highlighting sections of quotations and assigning first order codes to them. The list of first order codes from Atlas.ti can be found in APPENDIX F. The inductive process used essentially the same language used by the participants during the interviews to extract units of meaning. The second step of coding grouped the codes into categories, which was still an inductive process using normal business language to create these first order categories.

Step 3 involved a 'conceptual leap' which is a shift from the descriptive language to conceptual language. The choice of moving to conceptual analysis is described by Klag and Langley (2013) who define a 'conceptual leap' in the context of qualitative research as:

> bridging the gap between empirical data and theory by moving from the mass of words and other data (the world of the field), through and beyond the mechanics of analysis to an abstract and explicit set of concepts, relations and explanations that have meaning and relevance beyond the specific context of their development (the world of ideas) (Klag & Langley, 2013, p.150).

This involved a deductive approach of identifying patterns in the data using a conceptual framework as a lens. The conceptual framework that was used as a lens to map the categories into the themes was the Conceptual Framework created from the Literature Review in Chapter 2. This was relevant to the topics the literature analysed the current academic debates on the topics related to the research questions. A deductive process was followed to map the categories to the conceptual framework by identifying the themes or patterns in the data. Some of the themes could be mapped to existing themes on the conceptual map, additional themes that emerged from the data analysis were included in the revised conceptual framework under the relevant construct as new insights and understanding of the supply chain collaborations for transitioning to a circular economy. Gioia et al. (2013) assert that thematic analysis is considered appropriate for picking up patterns in the data. Further, Braun et al. (2022) describe this approach as reflexive thematic analysis, situated in qualitative research, and allows the researcher to reflect on the meanings expressed by the participants. Thematic analysis was appropriate for this qualitative study and also suited the research aims to conceptualise the insights from participants into theoretical categories or constructs tat would produce the conceptual framework.

Figure 4: The 4-steps of Data Analysis



The data analysis process indicated that data saturation was achieved. In qualitative research this is defined as when no more new codes are generated with each subsequent interview. The researcher noticed that after coding 12 interviews, the number of new codes generates started to diminish. The sample size was therefore considered sufficient to ensure rigour. Table 6 is a summary of the data analysis process.

Table 6: Summary of the 4-steps of data analysis

Step 1	First order codes generated	587
Step 2	First order codes generated	111
Step 3	Themes and sub-themes	21 and 7
Step 4	Theoretical Constructs	5

Following the analysis of the data, 21 themes (including 4 new themes) and 7 subthemes (including 4 new subthemes) emerged from the mapping process. The conceptual framework utilized had a number of themes and subthemes per research question. This revised conceptual framework is presented in Chapter 5 where the research findings are presented.

4.11 Research Quality and Rigour

Various quality assurance techniques were incorporated across the various steps of the research design, data collection, storage and analysis as well as in the discussion of findings and reporting on the research project. The systematic processes followed and reported on in detail add to the transparency, quality and rigour. The key criteria for evaluating quality and rigour in qualitative research are trustworthiness and authenticity (Bell et al. 2018). Bell et al. further elaborated that trustworthiness consisted of:

credibility, transferability, dependability, and confirmability. All these elements contribute to the quality and rigour of the research results. The various elements contributing to the reliability and validity of the methods and data in this research are summarised in Table 7 below.

Table 7: Research quality and rigour

Criteria	Elements contributing to quality and rigour in the research methods and data
Reliability / dependability	• Data triangulation between the research participant groups • Comparative analysis of the results to literature (Chapter 6)
Confirmability / objectivity	• Recorded interviews and audio files stored (with restricted access) for 10 years • Interview transcripts (without identifiers) uploaded on GIBS data repository
Internal validity (credibility)	• Systematic literature review with articles from credible highly rated journals • Credible sample size which demonstrated data saturation • Sampling method allowed for data triangulation in case and cross-case • Credible data analysis methods supported by methodology literature
External validity (transferability)	• Consistency matrix for the key literature • Interview protocol with open ended questions (eliminated researcher bias) • Systematic approach to purposive sampling with no researcher bias in selection criteria • Participant bias eliminated through selection criteria and data collection methods avoiding negative/positive judgemental responses. • Detailed discussion of the research findings supported by evidence (quotations) in Chapter 5

Source: Author's own – adapted from Bell et al. (2018)

4.12 Limitations of the research design and methods

The main limitation of this research design was that this was the first time that the researcher had conducted research of this nature. As a novice researcher it is possible there were some limitations in data gathering and analysis skills due to lack of prior experience in the interviewing and analysis processes. To mitigate this, the researcher followed the steps recommended in the research methodology literature. In addition, the researcher worked closely with the research supervisor throughout the process for advise and attended the research workshops offered by the university to gain additional knowledge. It is to be expected that a more experienced researcher would leverage prior experience in gathering the qualitative data and be more familiar with the analysis techniques and thus achieve superior results in comparison.

The second limitation was the boundary conditions applied to the sample design. The research was set using purposive sampling in the supply chain collaboration for a circular

economy in the sectors of FMCG, Mining and Heavy Industry and Packaging manufacturers. The implications are that due to the philosophical foundations of the methods selected, the results cannot be generalised onto other settings, they only explain the phenomenon within the selected setting.

Lastly, the circular economy field and concept is a subject that the researcher only had emergent knowledge on when this research was embarked on.

The next chapter will discuss the findings from the research conducted.

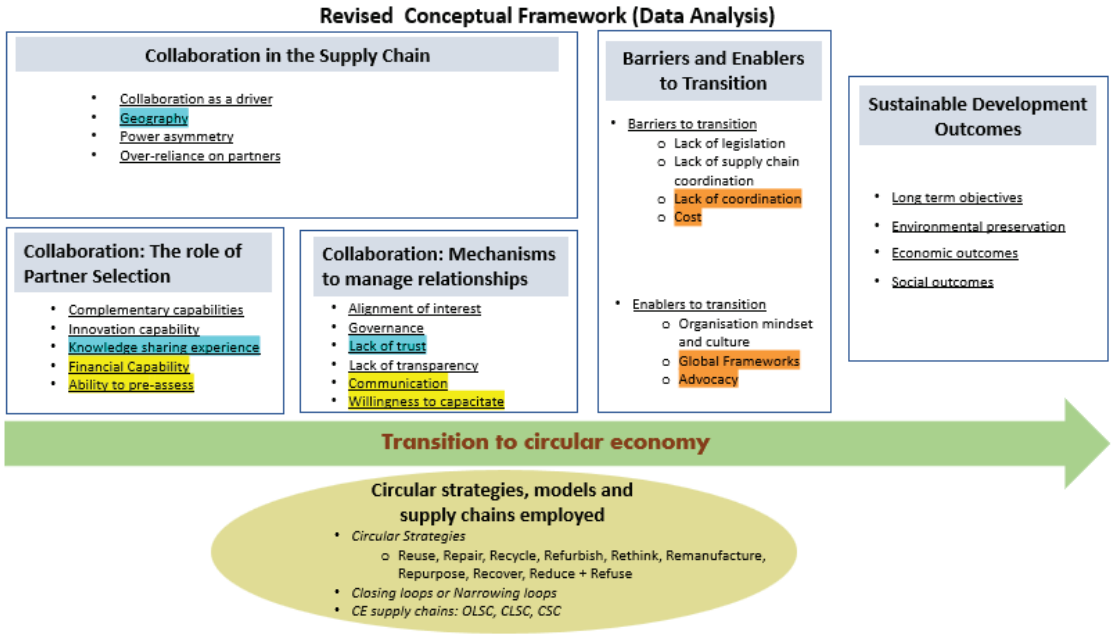
5. CHAPTER 5: FINDINGS

5.1 Presentation of Findings

The following section presents findings from the analysis of the data collected during the research as described in the Methodology section (see Chapter 4). The conceptual framework resulting from the

Following the analysis of the data 21 themes were mapped (including four new themes) and seven subthemes were mapped (including four new subthemes) onto the defined constructs of the Conceptual Framework. The constructs on the conceptual framework relate to each research question. In this chapter, not all the themes that emerged from the research data were discussed. The researcher carefully selected a total of 8 themes (including the four new themes) and the four new sub-themes, which based on the analysis of the data were considered to provide the deepest insights and new understanding of the research topic. Figure 5 below illustrates the revised conceptual framework resulting from the deductive analysis performed in step 3 and 4 of the data analysis (conceptual leap as described in Chapter 5).

Figure 5: Revised Conceptual Framework from the Data Analysis



The presentation of findings is organised by each research question as discussed in Chapter 3. For ease of reference, each participant group in the tables and quotations has been assigned a colour key as follows: FMCG, Packaging Manufacturers, Mining

and Heavy Industry and CE Consultants.

The researcher notes that in a qualitative study, the frequency of mention of a topic or theme by participants does not denote the level of importance. The individual experiences of the participants regarding the phenomenon was derived as insights into the relevant research question.

Not all the themes that emerged will be discussed. The selection of themes for discussion was based on the level of new insights and understanding gained from the research findings. All new themes that emerged which could not be mapped onto existing themes or sub-themes in the conceptual framework will be discussed as these indicated potential differences and new insights and understanding. Consistent with the key in the conceptual framework, existing themes (similarities) have no highlights, new themes or sub-themes (differences) are highlighted in yellow (for themes and orange for sub-themes) and existing themes or sub-themes with no data from the research were highlighted in blue. The themes or sub-themes with no data from the research were not discussed further.

5.2 Research Question 1: Supply Chain Collaboration

Circular economy strategies utilised

To introduce the findings on the main research question, it is important to first provide an overview of the various circular economy strategies employed by the groups of participants, see Table 8.

Table 8: Circular economy strategy used by each group of participants

CE Strategy	CE Consultants	FMCG	Mining & Heavy Industry	Packaging Manufacturer	Totals
Repurposing	2	6	1	-	9
Reduce (Consumption and Waste)	1	3	-	1	5
Recycled content	-	4	-	1	5
Reduce (Carbon Footprint and Waste)	2	2	-	-	4
Recycle/Reuse	-	1	2	-	3
Reuse	-	3	-	-	3
Life cycle assessment	2	-	1	-	3
Renewable Energy	-	2	-	-	2
Sustainable farming	-	1	-	-	1
Closing Loop (Packaging)	-	1	-	-	1
	7	**23**	**4**	**2**	

Table 8 above demonstrates the frequency of mention of each circular economy strategy exemplified by the research participants. The most frequently utilised was Repurposing, followed by Reduce and Recycle. In some instances, a combination of strategies were utilised. The group with the widest variety of examples provided was the FMCG group. This was attributed to the group's position in the supply chain being an integrated lead/focal firm. There were no CE strategies or business models that involved the "product-as-a-service" business model.

The themes related to the research question about how the supply chain collaboration facilitates the transition towards the circular economy will be discussed in this section. There were three themes which emerged from the data analysis and two of these, where rich insights were gained will be discussed as indicated in Table 9 below.

Table 9: Themes emerging from RQ1

Theme	**Similarities**	**Differences**	**Discussed (Yes/NO)**
	Existing theme	**New theme**	
Geography	X		**NO** No data
Power asymmetry*	X		**Yes** Insights
Over-reliance on partners	X		**NO**
Supply chain collaboration drives transition to circular*	X		**Yes** Insights

KEY:
New (sub)themes
Existing theme - No data

Table 10: Frequency and main topics on RQ1 Themes

	Group FMCG	**Group Packaging manufacturing**	**Group Mining and Heavy Industry**	**Group CE Consultants**
Power Asymmetry* *Topics*	Some *Consider inputs*	Some *Consider inputs*	Low or none *Learnt not impose*	Many *Focal firms dictate*
Overreliance on partners *Topics*	Many *Competitors, sole supply, noncompliance*	Low or none *Noncompliance*	Low or none *Dependency*	Many *Domino effects on value chain*

Supply chain collaboration drives the transition* *Topics*	Many *Innovation driver, environmental performance*	Low or none *Value chain considerations*	Low or none *Value chain considerations*	Some *Drive sustainability and SDGs through capital allocation*

Table 10 above is a summary of the frequency of mention of the theme by each group (i.e., Many/Some/Low/None) and the main topics that were exemplified.

5.2.1 RQ 1: Theme 1 – Supply chain collaboration drives the transition

This theme was selected for discussion of the findings due to the diversity of experiences within case as well as cross-case as summarized in Table 9 above. The variety of participants' experiences provide rich insights into the research question and contributes to a deeper understanding of the phenomenon.

5.2.1.1 Evidence of supply chain collaboration drives the transition

RQ1 Theme 1 – Supply chain collaboration drives the transition
FMCBV1 "*And we also manage the health and safety and environmental part, because before any supplier is onboarded, there is certain requirements in terms of safety, health, environment that they need to comply to in order for them to be onboarded.*" 11:16 ¶ 91 in 1 FMCBV1
FMCBV4 "*We have usually innovation days with our suppliers and a big focus on innovation as it surrounds sustainability. So, we have those once a year where we have suppliers from literally all over the world.*" 7:13 ¶ 110 in 13 FMCBV4
FMCBV3 "*Umm it's supply chain which is the manufacturing which is environmental compliance of SDG6 and SDG12, umm a bit of SDG9.*" 8:10 ¶ 63 in 8 FMCBV3
FMCBV3 "*I think the key challenge is if you look at sustainability as only a supply chain responsibility, umm and the reason is that, my reasons from reasoning from the beginning as if you don't have a full manufacturing, supply chain, logistics, procurement you can end up only focusing on the E of sustainability and therefore losing, umm the S and the G component of sustainability. I think that's a challenge.*" 8:31 ¶ 168 in 8 FMCBV3
PLSMN2 "*Coming back to the value chain, it's critical that when you are looking at sustainability, is that the various roleplayers do participate and engage around specifics. For example, you plan to replace plastics with an alternative, if you're not talking to brand owners, retailers, the converter, the recycler, you might end up creating a new product that's actually worse or more problematic in terms of end-of-life opportunities and dealing with it.*" 18:4 ¶ 48 in 16 PLSMN2
OTCOX "*And like I said, in terms of procurement internally being a critical partner, policies and procedures need to be in place that recognize all, in terms of awarding of contracts or tenders, or whatever it is depending on the space, sustainable performance or criteria in terms of the RFQs and how they are rated in terms of awarding scores*" 14:6 ¶ 59 in 5 OTCOX
OTMIN1 "*If it cannot be done from source with what we have already in the mine, what do we then do with it cause then we started coming up with different ideas of, you know, how do we change it into different components where we can sell it, use it for fertilisers, there was different solutions towards that. So, but it starts with understanding. Do we really need to have those pallets*

on site or not and it takes having those kind of discussions with your suppliers." 2:5 ¶ 33 in 10 OTMIN1
CONCE3 "*You can't think about sustainability as an organisation in the context of both current and future legislation, regulation, and even you're a listed entity, stakeholder requirements, if you aren't thinking about both your supply chain and your broader value chain as part of your sustainability agenda.*" 5:7 ¶ 29 in 11 CONCE3
CONCE3 "*is the role of the supply chain, particularly in a corporate environment, to actually effect some of the sustainable development goals that we're looking for. Because of the power of capital that is so heavily concentrated in the private sector, big corporates, when you think of large-scale supply chains, have a critical role to play in enabling things like gender equality, social justice, addressing inequalities, but also driving innovation.*" 5:8 ¶ 31 in 11 CONCE3
CONCE3 "*So, it's not just about addressing the negatives, but it is also about driving some of the positives that are associated with sustainability through the power of where they place their money when you think of it from a corporate supply chain perspective.*" 5:9 ¶ 31 in 11 CONCE3

5.2.1.2 In-Case and Cross-Case analysis of the Evidence

The FMCG group of participants' experience with how supply chain collaboration drives the transition towards a circular economy was varied. FMCBV4 had experienced the supply chain collaboration as an innovation driver through encouraging suppliers to innovate for the annual innovation showcase. A different perspective was illustrated by FMCBV1 whose experience was that supply chain collaboration drives the transition towards a CE through the evaluation criteria prior to onboarding supply chain partners, which included health safety and environmental performance. FMCBV3's experience also differed from the other participants in the group with insights regarding the limited extent to which supply chain influences the transition, due to it being focused only on the environmental aspects ESG excluding the other pillars. FMCBV3 further expressed that supply chain dealt mainly with the manufacturing element of their business and thus only drives targets on SDG 6, 9 and 12.

The Packaging Manufacturers, illustrated by PLSMN2, experienced the supply chain collaboration facilitating the sustainability dialogue amongst the various role-players in the value chain and thus prevents creation of new products with end-of-life problems.
The experiences of participants in the Mining and Heavy Industry were similar as illustrated by OTCOX and OTMIN1 who expressed that through procurement performing an analysis of the requirements and the value chain, supply chain collaboration instills the sustainability mindset.

The experiences of participants in the CE Consultants group were illustrated by CONCE3 who shared that when organisations consider current and future legislations they must consider their supply chains and the broader value chains as part of their sustainability agendas. CONCE3 further added that the corporate supply chain goes beyond fixing the

negatives but also drives the positives associated with sustainability through the allocation of financial resources. CONCE3's other unique insight was regarding the critical role of big corporates with large scale supply chains in addressing social issues and driving innovation through their large spending capacities.

The cross-case comparison (FMCG vs. Packaging Manufacturers vs. Mining and Heavy Industry vs. CE Consultants). The FMCG group's experience, illustrated by FMBV4 about supply chain collaboration driving the transition through driving innovation is similar to the CE Consultants group, as illustrated by CONCE3. The experience of the Mining and Heavy Industry group illustrated by OTMIN1 have elements of value chain considerations that drive the transition similar to the CE Consultants group illustrated by CONCE3. By contrast, the FMCG group illustrated by FMCBV3 experience is that supply chain drives only the environmental performance of manufacturing and fails to facilitate transition for the broader value chain.

The CE Consultants group had a unique experience of supply chain collaboration driving the transition through the allocation of capital or financial resources, particularly by large corporates. This was not experienced by any of the other participant groups.

5.2.1.3 Conclusion on Supply Chain Collaboration Drives the Transition

The FMCG and CE Consultants groups of participants had similar experience of supply chain collaboration driving the transition to a CE by driving innovation. This was done through platforms created for sharing of information such as innovation showcases. The Mining and Heavy Industry group individual participants had similar experience of how supply chain collaborating drives the transition through applying value chain considerations in sourcing. The criteria used to assess partners also included compliance with health, safety and environmental standards which therefore encouraged compliance across the value chain. There was a unique insight from the FMCG who had experienced that there was insufficient consideration of the broader value chain in the collaborations.

The Packaging Manufacturer group stated that the supply chain collaborations facilitate a dialogue on sustainability issues amongst the value chain partners and this plays a role in preventing undesirable development of new products that may create end of life problems. This was shared by the Mining and Heavy Industry group who expressed those collaborations instilled a sustainability mindset internally through the joint assessment of requirements.

Similarly, the sustainability mindset was expressed by the CE Consultants group who illustrated that organ the negative impacts of the linear system but proactively driving

positive CE related changes. Organisations were going beyond just fixing A unique experience from the CE Consultants group which was not experienced by any of the other groups was the drive towards the transition through allocation of financial resources to sustainability initiatives. The element of size was emphasised here as large corporates with large spending capacity could thus effect big scale impacts.

5.2.2 RQ 1: Theme 2 – Power Asymmetry

The theme of power asymmetry emerged from the data analysis as many of the participants shared the experiences of an imbalance of power in the supply chain collaboration relationships. This was selected for discussion due to the diversity of experiences within case (each group of participants) as well as cross-case comparison of the groups of participants. This allows for rich insights into the participants experiences and contributes to a deeper understanding of the phenomenon.

5.2.2.1 Evidence of Power Asymmetry

RQ1 Theme 2 - Power asymmetry
FMVAR1: *"you have situations where you might want to impose what you think is the solution"* 1:19 ¶ 67 in 1 FMVAR1
FMVAR1: *it's really important to consider their input and very often it's things that you would not have even thought about and then once you do start working with them, like it starts to, the pieces start to fit together as you begin to understand while working with them"* 1:37 ¶ 67 in 1 FMVAR1
FMCBV2: *"And it's really just about being open to engage, open to have other stakeholders' input shift your sort of way of... not necessarily your way of working, but your perception of how we can make this goal something that includes the voices and the narratives of all of our key partners."* 3:37 ¶ 82 in 3 FMCBV2
PLSMN1: *"And then also, finding out from the customer side, going back to our suppliers, saying, "Right, guys. In this partnership, what can we now do? This is what they are requiring, how can we come from top down and then bottom up, and then managing that kinda thing in the middle and trying to see what solutions are now currently out there, and also what is being developed?""* 17:25 ¶ 171 in 15 PLSMN1
PLSMN2: *"For me, collaboration, it's not bringing just my view and my position to the table and stick to that, it's a matter of, "What is the problem, what is it that we're trying to achieve, and how do we solve that?"* 18:15 ¶ 78 in 16 PLSMN2
OTMIN2: *"It's around being open to hearing the feedback as well, because it's not a one-sided thing, it has to be two-sided."* 16:9 ¶ 93 in 14 OTMIN2

OTMIN2: *"And I think what's also important is, before you have an engagement, understanding the key points that the other party would also like to engage on. Because sometimes, you set an agenda to say, "I think these people would want to hear this", but did you ever have an opportunity to understand from them, what would they like to have discussed in that session, so they know that agenda, or the way of what we're communicating, was collaborative, versus it being, "This is my agenda, this is what we will talk to"?"* 16:17 ¶ 107 in 14 OTMIN2
OTMIN1: *"it's starts with just involving your partners from scratch, right. So there's, and I think it's a lesson we've learnt in a very long term to say that sometimes we look at our partners as people that must just deliver.Like I want this unit to deliver, I want this unit to deliver and you know, I think that is changing with time because we really want to make sure that from, you know, formulation of whatever that we would want, that they would be aligned, so that they can be able to say that as much as you want this and you want it on a monthly basis, I've got a challenge with movement of my equipment from Ukraine to South Africa because of what's happening."* 2:11 ¶ 75 – 77 in 10 OTMIN1
OTMIN2: *"With the scheduling, it's the matter of, is it flexible? Because if it's not flexible, then you are saying to people, "I'm dictating", versus, "I want us to be on that journey.""* 16:16 ¶ 105 in 14 OTMIN2
CONCE3: *"I think there are examples, and particularly the examples that I've seen that have worked best are the ones where supply chain businesses or businesses in the supply chain are brought into specific initiatives or specific programs, often linked to SED and ED targets, and expenditure, where there is more likely to be collaboration."* 5:17 ¶ 57 in 11 CONCE3
CONCE3: *"In my experience, very few corporates collaborate with their supply chain, they dictate from the top down. I think it's a very unequal power relationship."* 5:16 ¶ 57 in 11 CONCE3
CONCE2: *"So really it's more just a case of matter of perspective is understanding roles, responsibilities, influence, outcomes and then managing that process through networks. It's difficult enough to manage just the main components of that supply chain but the opportunities of virtual media now allow you to be able to bring in all those different components into that system and often what you find is that, your more important spokes in the wheel will stand out more and the lesser ones will not"* 10:29 ¶ 105 in 9 CONCE2

The above table contains the actual quotations from the semi-structured interviews conducted with the various research participants and are referred to in the analysis below.

5.2.2.2 In-Case and Cross-Case analysis of the Evidence

On the theme of power asymmetry in the supply chain collaboration, the Consultants group had experienced that corporates rarely truly collaborate, they dictate from the top (CONCE2). This demonstrates an unequal relationship amongst the supply chain partners based on their position in the supply chain. Another participant stated that due to the many spokes of the wheel and dimensions to be managed in collaborative relationships it becomes a matter of prioritizing which spokes stand out to have the biggest impact or influence and thus focus on those (CONCE3). A unique insight was shared by CONCE3 who stated that the more successful collaboration efforts were linked

to the Supplier and Enterprise Development (SED/ED) programs where supplier organisations are brought into the initiatives and the lead firms' commitment and metrics for success is linked to those targets. This revealed a unique interplay of size vs. dependency in the power dynamic of the relationship.

The Mining and Heavy Industry participants group expressed a tendency by the mining firms to set the agenda and think on behalf of people/communities (OTMIN2). A unique insight from this group was the importance of the manner including the flexibility of scheduling where the lead firm should not come across as dictating what should happen (OTMIN2) but indicate willingness to partner on a journey. In addition, OTMIN1 expressed that the lead firms' requirements should be informed by partners constraints which must be taken into account in formulating a realistic solution or delivery schedule. It appears as that despite having a dominant position in the supply chain, there is recognition of and willingness to treat other partners as equals

The FMCG group of participants expressed having experienced the temptation to impose what they think is the solution (FMVAR1). Lessons learnt include ability to listen to other perspectives as this adds value to the collaboration by shifting the way of thinking to newer avenues that may not have emerged.
The Packaging Manufacturer group highlighted the importance of true collaboration being not just bringing or forcing one's own position. This group had a unique experience due to its position in the supply chain being in the middle, thus dealing with it is upstream suppliers as well as its more dominant customers the brand owners or producers of the products to be packaged. PLSMN1 said both the customer's and the supplier's positions, requirements and ideas were important to take into consideration to arrive at an optimal solution and this would involve iterative interactions from top down and then bottom up.

All four participants groups experienced power asymmetry in the supply chain collaboration. All the groups experienced the tendency to impose or dictate to emanate from the lead firm that is seeking a solution/supply of goods or services, these were respectively illustrated by FMVAR1, OTMIN2, PLSMN1 and CONCE2. The power asymmetry is linked to the position and level of influence in the supply chain. The four groups similarly experienced that a willingness to consider the partners' inputs in terms of their requirements or other ideas enhances the success of the collaboration.
There were two unique insights, one from the Consultants group (illustrated by CONCE3) and another from the Mining and Heavy Industry group (illustrated by OTMIN2). CONCE3 mentioned the role of SED/ED programs in the power asymmetry theme which

creates alignment as well as defined roles and hierarchy since the suppliers are selected to be developed and the lead firm has vested interest in meeting those targets in spend and impact. OTMIN2 shared the subtlety of power dynamics demonstrated by scheduling meetings and deadlines without flexibility which is perceived as dictating to partners who have less bargaining power. Most of the groups shared experience of lessons learnt and that considering others' inputs alleviates the asymmetry. The Consultants group, illustrated by CONCE2 stated that they had not experienced corporates truly collaborating they tend to dictate from the top. This demonstrated a power imbalance rooted in the dominant role of influence, size and position in the supply chain.

5.2.2.3 Conclusion on Power Asymmetry

All four groups of participants had experienced the power asymmetry theme in their supply chain collaborations. All groups had similar experience that the power balance was skewed towards the lead firms and was influenced by the position and level of influence in the supply chain which created a tendency to dictate or impose solutions on the other partners. The four groups had similarly experienced that a willingness to consider the partners' inputs in terms of their requirements or other ideas enhanced the success of the collaboration.

A key insight from the Packaging Manufacturer group was unique due to its position in the supply chain being in the middle, thus dealing with its upstream suppliers as well as downstream with its more dominant customers the brand owners or producers of the products to be packaged. The insight was that both the customer's and the supplier's positions, requirements and ideas were important to take into consideration to arrive at an optimal solution and this would involve iterative interactions from top down and then bottom up.

The Mining and Heavy industry group also shared an experience of the subtle power dynamic presented in how meetings were scheduled without flexibility which could be perceived as dictating to partners.

Another unique insight was from the Consultants group regarding Supplier and Enterprise Development (SED/ED) programs having better success with managing the power asymmetry dynamics of collaboration due to the dependence of the larger firm on the achievement of the targets, this revealed a unique interplay of size vs. dependency. Lastly, the Consultants group had also experienced that corporations rarely collaborated without dictating to partners from the top. This demonstrated a power imbalance rooted in the dominant role of influence, size and position in the supply chain.

5.3 Research SubQ1: Role of Partners Selection and Capabilities

The themes related to the research question about the role of partner selection and partner capabilities in supply chain collaboration for circular economy will be discussed in this section. The main themes emerging from the analysis were the partner selection criteria and processes. The researcher identified four main themes from the analysis of the data collected. Three of these four themes will be discussed as indicated in table below.

Table 11: Themes emerging from Research SubQ1

Theme	**Similarities**	**Differences**	**Discussed (Yes/No)**
	Existing theme	**New theme**	
Complementary Capabilities	X		YES Insights
Innovation Capability	X		NO
Knowledge sharing	X		NO No data
Ability to Pre-assess		X	YES Insights
Financial Capability		X	YES Insights

Table 12: Frequency and main topics on Research SubQ1

	Group FMCG	**Group Packaging manufacturing**	**Group Mining and Heavy Industry**	**Group Consultants**
Complementary Capabilities *Topics*	Many *Expertise* *Control* *Delivering outcomes*	Low or None *Strengths*	Low or none	Many *Delivery Efficiency*
Ability to pre-assess *Topics*	Many *Interrogate value chain* *Pilots to assess*	Low or none *Market research* *Realistic specifications*	Some *Can they deliver as claimed?* *Self-assessment*	Low or none
Financial Capability *Topics*	Some *Back expertise with funding/investment*	Low or none	Low or none	Low or none *Manage finances*

5.3.1 Research SubQ1: Theme 1 - Complementary Capabilities

This theme was selected for discussion due to the diversity of experiences within case as well as cross-case. This allows for rich insights into the participants experience and contributes to a deeper understanding of the phenomenon. The importance of a supply chain collaboration partner having complementary capabilities was mentioned many times by participants in the FMCG group as well as the Consultants group. This refers to finding a partner who has different capabilities that complement one's organisation's capabilities in delivering the desired outcome. One mention was made by the Packaging Manufacturers group. None of the Mining and Heavy Industry group of participants explicitly mentioned this theme. The key sentiment from the FMCG and CE Consultants participants was the ability to focus on the relevant company's core strengths and use partners to complement other areas with their expertise. The perspectives of these two groups are mainly from the focal company's ("brand owner") perspective. Participants in the packaging manufacturing group are the supply chain partners who are selected by the brand owners. The single mention from this group related to the partner selection for their own inbound supply chains.

5.3.1.1 Evidence of Complementary Capabilities

Research SubQ1 Theme 1 - Complementary Capabilities
FMVAR1: *"That's why we select partners. It's because we don't have that expertise and knowledge within our business and we know that we need partners if we want to achieve a certain end goal."* 1:34 ¶ 63 in 1 FMVAR1 40m40s
FMCBV2: *"He sits down with us, understands our need, and they're able to implement at scale that we aren't able to"* 3:53 ¶ 122 in 3 FMCBV2 48m
FMCBV4: *"And we obviously produce waste, we produce packaging that either will land up in landfills or wherever, and so we need to identify initiatives that can reduce that waste, or at least collect it and make sure that it goes back into the system, and we're able to do that through the various partners that we select."* 7:17 ¶ 132 in 13 FMCBV4 36m
PLSMN1: *"but it's also finding out from our suppliers and looking into the market as, "What are you guys doing to offer this more sustainability, more circular economy?" So, it's finding out from their side, what are they doing? What products that we are currently bringing into the market can we look at changing to more sustainable alternatives?"* 17:24 ¶ 165 in 15 PLSMN1 44min
CONCE2: *"So when you look at partnerships, it's really a case of trying to ensure that your different partners focus on what their strengths are."* 10:8 ¶ 69 in 9 CONCE2 35m09s **CONCE2**: *"so partnerships are important in terms of understanding that people need to focus on what they good at."* 10:5 ¶ 57 in 9 CONCE2 35m09s

CONCE1: *"For me to be efficient, and effective, achieve results, I have to have a laser focus and be clear about what value I bring to projects, and from what stage I take them to what stage I take them"* 4:50 ¶ 179 in 4 CONCE1 1h32m
CONCE4: *"So I think it's around understanding core business, what you have control or leverage over and what you need your partners to help you with."* 6:5 ¶ 31 in 12 CONCE4 34m48s
CONCE5: *"I work for an organization that facilitates funding but doesn't have quite a lot in our own core resources, so we always deliver through partnerships. So you want to bring in someone who can bring in the skills, who can bring in expertise, you know, who can bring in the research so you're always looking for the technical aspects of it. You are also looking for a partner who'll be able to deliver."* 13:16 ¶ 62 in 2 CONCE5 31m52s

5.3.1.2 In-Case and Cross-Case analysis of the Evidence

The in-case analysis was first done within a group of participants (i.e., within each of FMCG and CE Consultants) identifying specific insights within each group and thereafter the cross-case analysis compared the various groups of participants (FMCG vs. CE Consultants vs. Mining and Heavy Industry vs. Packaging Manufacturer).

Each of the FMCG participants offered a unique perspective to the importance of finding complementary capabilities. FMVAR1 stated they sought partners who complemented gaps where they do not have expertise, FMCBV2 shared that they sought partners who, based on these complementary capabilities, could augment the scale of impact better than the core organization could. FMCBV4 provided insight regarding seeking partners who had capabilities within the extended supply chain created by the circular business model to complement the skills required there. Each FMCG participant had a unique organisational experience of complementary capabilities based on the challenge they were addressing. Each was different to the other experiences within the FMCG group of participants.

The CE Consultants' individual insights were similar to each other in that they had experienced that partners' capabilities must complement the business such that the business can focus on and leverage its own core strengths. CONCE1 stated the value of partners was derived from each partner focusing on its own strength, CONCE2 stated they need laser focus to be efficient and CONCE4 mentioned the value of having control and leverage on the core business letting partners perform ancillary activities that complemented the strategy. In addition, CONCE5 also highlighted the efficiency of delivery gained from having partners who complemented each other. There were many mentions of complementary capabilities within the CE Consultants group and each with

a similar experience of how these capabilities enhance focus and efficiency.

Comparing the two groups (FMCG vs CE Consultants) to each other, the FMCG group was illustrated by FMVAR1 who said they select partners who have expertise and knowledge that the business does not have, this compared to the CE Consultants group, illustrated by CONCE2 who said that partners must have different strengths and each focus on their core strengths to deliver. These both emphasize the similarity experiences of the two groups that the impact of partners complementary capabilities have on the efficiency of delivery.

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The Consultants group, illustrated by CONCE5, have experience of how partnerships enable delivery through combining different organisations with different capabilities. The CE Consultants groups have experienced circular economy initiatives in a holistic manner due to the role they play of coordinating and providing strategic direction. There were similarities between the groups based on a holistic perspective used to view the collaboration and there are unique experiences which emanate from individual participants working in organisations with different capabilities and pursuing unique initiatives.

By contrast to all the groups of participants, the packaging manufacturers, illustrated by PLSMN1, had experience of complementary capabilities in its own inbound supply chain and not the supply chain they were supplying into.

5.3.1.3 Conclusion on Complementary Capabilities

The importance of complementary capabilities was expressed by many participants in the FMCG and the CE Consultants groups. Within the FMCG group there were diverse experiences that are organisation centric. Within the CE Consultants group there were similar experiences. The variation of how the complementary capabilities were experienced was in terms of the value that these capabilities add. Each FMCG participant had experienced how their organisation considers what would be complementary based on its own strengths or capabilities as well as the problem or challenge at hand. In some instances, this may be expertise, scale, position in the supply chain or the ability to free capacity and thus improve focus and efficiency for the organization. The CE Consultants had similar experiences in that each had a holistic view of project delivery, focusing on optimising delivery by putting together partners who complemented each other's strengths. Some elements of this holistic view were similar to some of the FMCG group participants where internal gaps were complemented by

partners to enable delivery. A unique experience from the FMCG group was a participant who had experienced complementary capabilities being utilized to capacitate the organisation in carrying out new tasks as a result of the extended supply chain into reverse logistics, which was different from other FMCG as well as the CE Consultants group. The packaging manufacturer experience was also unique in that their perspective was in its own inbound supply chain and not the supply chain they were supplying into.

5.3.2 Research SubQ1: Theme 2 - Financial Capability

The theme of financial capability was mentioned by two of the participant groups as an important factor in partner selection, the CE Consultants as well as the FMCG group. There was no mention of the financial capability theme by the Mining and Heavy Industry or the Packaging Manufacturer groups of participants.

5.3.2.1 Evidence of Financial Capability

Research SubQ1 Theme 2 - Financial capability
CONCE5: "*We also look at, you know, financial capability who can manage finances who can drive projects, who can supervise*" 13:18 ¶ 64 in CONCE5
FMCBV2: "*partners that are able to back their partnership, whether that's with funding, whether that's with expertise, whether that's with bringing together the right partners. It's partnership in action, and it's longstanding partnership, that's fundamentally what we're looking for*" 3:18 ¶ 54 in 3 FMCBV2
FMCBV2: "*We understand and we agree to the goal, or the intention and the vision. We are able to back it, whether it's with funding, and of course that's one of the most important parts of the longevity of any partnership, is being able to actually back it with some sort of investment, but understanding that investment of any kind can also be, and is also, extremely valuable in any partnership.*" 3:23 ¶ 60 in 3 FMCBV2

5.3.2.2 In-Case and Cross-Case analysis of the Evidence

The CE Consultants group as illustrated by CONCE5 expressed they had experienced financial capability to be an important consideration in the selecting partners for collaboration towards a CE. In addition to an ability to drive projects or supervise, they favoured partners who had financial capability and who could manage finances. The FMCG group as illustrated by FMCBV2 expressed that in their experience they needed partners who could back up their other capabilities with funding or some form of investment. Funding was considered extremely valuable and one of the important factors contributing to the longevity of the supply chain collaborations.

A cross-case analysis of these two groups illustrated that the experiences were similar. Both groups recognised the importance of other capabilities, however the financial capability or ability to back up the collaborative efforts with some sort of investment was expressed as an additional requirement. This appeared to be a requirement over and above other screening criteria that may be used to select a partner. A nuance of difference between these two groups was that for the CE Consultants group the financial capability related to managing finances as opposed to having funding resources as expressed by the FMCG group.

By contrast, in the Mining and Heavy industry as well as the Packaging Manufacturers participant groups, the ability to fund/invest or manage finances was not mentioned at all.

5.3.2.3 Conclusion on Financial Capability

The importance of financial capability was expressed by two participant groups, the CE Consultants and the FMCG groups. None of the Mining and Heavy Industry or Packaging Manufacturer groups mentioned financial capability as an important criterion in selecting partners to collaborate with. There was similarity in the experiences of the two groups being that the financial capability was an additional criterion over and above the ability to deliver expertise or partner networks. The difference between the two groups was that for the Consultants group emphasis was on ability to manage finances, whereas for the FMCG group the emphasis was a requirement for the partner have the ability or financial resources to make an investment into the collaboration activities, which was considered critical for the longevity of the partnership.

5.3.3 Research SubQ1: Theme 3 - Ability to pre-assess partners

The ability to pre-assess emerged as a theme related to the role of partner selection and partner capabilities in the supply chain collaboration. Many participants form the FMCG group of participants had experienced this theme, some from the Mining and Heavy Industry group and a low number form the Packaging Manufacturer group. No participants from the CE Consultants group expressed having experienced the ability to pre-assess partners as a factor in partner selection.

5.3.3.1 Evidence of Ability to Pre-assess partners

Research SubQ1 Theme 3 - Ability to Pre-assess partners
FMVAR2: *"So, when we choose our partners, we say, "Okay, so you are saying you can supply us biodegradable and compostable food packaging." "Yes, we can." "Right, let's talk about it." And then you start digging, you evaluate. You ask a series of questions that's all aligned with your vision, and then you discover that most biodegradable and compostable packaging on the market today uses starch as the building block to make it. And where do you get the starch from, how do we get it from? Maize, corn and rice and cassava and potatoes, but what are you doing by knowing where you get all this corn?"* 19:15 ¶ 104 – 106 in 17 FMVAR2
FMVAR2: *"Okay, so when you embark on a sustainability journey and we start talking sustainability, I can assure you there's 100 people out there that's going to put up their hand and say, "We've got the answer." But the first thing you've got to realise is that there is no one silver bullet, no one thing is going to make your company turn around from a currently non-sustainable environment and training environment to a suddenly sustainable environment."* 19:14 ¶ 101 in FMVAR2
FMVAR2: *"So, you have to have a set of questions. You have to have a set of ideas, and you have to interrogate every step of the way all those who come to your door and knock on your door and say, "We've got an answer to sustainability.""* 19:16 ¶ 120 in 17 FMVAR2
FMVAR1: *"it's a process getting there, you don't know if it's the correct partner"* 1:11 ¶ 55 in 1 FMVAR1
FMVAR1: *"often pilots are needed, we tend to work with smaller pilots but if you have a really well established technology and you know exactly what's needed and there is a range of different partners that you could work with then it's all about you know request for tenders and going through the whole process to select that partner but ja it's essential."* 1:32 ¶ 55 in 1 FMVAR1
PLSMN1: *"I think, ja, in terms of the collaboration, I think it's understanding what is out there. You need to know what is available on the market, because you can't just wish for something that doesn't exist. I mean, we all want that, you all want a plastic that you can put it in a specific type of... you put a drop of salt and water, and the whole plastic dissolves, and it's all environmentally friendly, you can use it to water your garden, but that does not exist."* 17:21 ¶ 133 in PLSMN1
OTWAT: *"Key challenges, the key challenges is getting to know the partner and knowing exactly what it is, that they can deliver or whatever they say they think is deliver is actually knowing if it is that they can deliver, if it is that exact thing they can deliver to you because that way, the issue is with the partners that we have been struggling with now, the bottles partner and the recycling partner"* 15:26 ¶ 149 in 7 OTWAT
OTMIN2: *"So, we even asked them to do an analysis of their current work structure, the skill set that they've got, the infrastructure that they have, so that we said, "This is what we expect out of this rehab activity. Match yourself to that.""* 16:7 ¶ 83 in 14 OTMIN2

5.3.3.2 In-Case and Cross-Case analysis of the Evidence

The FMCG group expressed diverse experiences regarding ability to pre-assess partners. FMVAR2 highlighted the importance of a partner being aligned to the lead firm's vision. To that end they have a detailed questionnaire that drills down into the whole value chain and practices of the potential supplier's supply chain. They perform a

rigorous pre-assessment and interrogate every input into the process. Within the same group there was a different experience illustrated by FMVAR1 whose experience was that it is difficult to know if the selected partner was the right one as very often they are seeking a new solution or technology and they do not know what they require. Pilots are therefore useful as part of the partner assessment in these cases.

The Packaging Manufacturer group illustrated by PLSMN1 had experience similar to FMVAR1 in terms of not knowing what solutions were available therefore some market research was required to be able to specify the requirements. The market research also ensured the specification was realistic instead of requesting a utopian solution that didn't exist , FMVAR1 said: "*I mean, we all want that, you all want a plastic that you can put it in a specific type of... you put a drop of salt and water, and the whole plastic dissolves, and it's all environmentally friendly, you can use it to water your garden, but that does not exist.*"

The Mining and Heavy industry had different experiences within the group. This is illustrated OTWAT had experienced that knowing upfront what the partner could deliver was a challenge as some partners make claims and in reality, cannot deliver and you find out later. OTMIN2's experience was that they were able to assess partners by providing them specifics of what was required and request each potential partner to rate themselves on each element in terms of structure, skills and infrastructure ability to match the requirements. The Mining and Heavy Industry groups experience was different from the other groups.

The CE Consultants' group was different in that they did not express experience of ability to pre-assess the partners.

5.3.3.3 Conclusion on Ability to Pre-assess Partners

The FMCG group expressed diverse experiences with respect to the ability to pre-assess partners which included alignment with the lead firm's vision, having a detailed questionnaire which interrogates the value chain and the potential suppliers supply chain and inputs. Within the same group there was a participant who had a different experience in terms of ability to pre-assess a partner when the lead firm was not certain what was required with a new technology or novel solution. In such cases they had experienced that pilots were useful as a pre-assessment tool. The Packaging Manufacturer group had experience similar to the FMCG group difficulty in specifying what was required for new products or solutions. In such cases undertaking market research ensures that the specifications requested are realistic and match what the market can offer and not some

utopian solution that do not exist.

The Mining and Heavy industry had diverse in-group experiences which were also unique to the group, these included the challenge of not being able to assess upfront what the partner could deliver according to their claims. A different experience within the same group was providing each potential partner a set of requirements to measure themselves against in terms of working structure, skills and infrastructure and rate their ability to match the requirements. The CE Consultants' group was different in that they did not express experience of ability to pre-assess the partners.

5.4 Research SubQ2 Mechanisms used to manage collaborative relationships

The themes related to the research question about the mechanisms used to manage the collaborative relationships in supply chain collaboration for circular economy will be discussed in this section. The researcher identified four main themes from the analysis of the data collected. Two of these four will be discussed as indicated in Table 13 below.

Table 13: Themes emerging from Research SubQ2

Theme	**Similarities**	**Differences**	**Discussed (Yes/No)**
	Existing theme	**New theme**	
Alignment of interest	X		**NO**
Governance	X		NO
Communication		X	YES Insights
Willingness to capacitate		X	YES Insights

Table 14: Frequency and main topics on Research SubQ2

	Group FMCG	**Group Packaging manufacturing**	**Group Mining and Heavy Industry**	**Group Consultants**
Communication *Topics*	Many *Flow of information* *Technology as a tool*	Low or none *Flow of information*	Low or none *Industry platforms*	Many *Industry platforms* *Clear communication*
Willingness to Capacitate *Topics*	Some *Learning together* *Capacitate BEE partners*	None	Some *Training interventions*	Some *Building capacity* *Provide management tools*

5.4.1 Research SubQ2: Theme 1 – Communication

5.4.1.1 Evidence of Communication

All the participant group had experience of communication as a mechanism to manage the collaborative relationships.

Research SubQ2 Theme 1 – Communication
FMVAR1: *"so it's just maintaining that relationships and having regular interaction and onsite visits if there isn't a global pandemic going on."* 1:41 ¶ 77 in 1 FMVAR1
FMCBV2: *"And I think also just having the right platforms in place for partners and the stakeholders to come together and do knowledge sharing, that is still I think one of the very... It sounds old fashioned almost, but it's really critical to have the right conversations."* 3:44 ¶ 93 in 3 FMCBV2
FMCBV3: *"So the first collaboration is actually is to talk to each other and come to a mutual understanding of what it is we looking for and not to assume something about the others in the internal space."* 8:24 ¶ 156 in 8 FMCBV3
FMCBV2: *"And we've seen perfect examples of this in our banking blockchain partnership in the rest of Africa, in [Country X and Y], where they're able to not just see the level of granularity as we provide seed, for example, to our farmers, we're also able to see those transactions, and our farmers get paid in real time with mobile money, and that in itself is a perfect example where technology's a great tool to drive collaborative effort, and drive the needle on sustainability."* 3:43 ¶ 93 in 3 FMCBV2
PLSMN1: *"So, I think it's that, the partnerships and the constant communication that we have between our customers and our suppliers and ourselves, building that kind of relationships, and building that flow of information and knowledge."* 17:36 ¶ 220 in 15 PLSMN1
OTCOX: *"So, you would find for example, the JSE would host a seminar where sustainability experts would come and share their experiences, the challenges that they come across in terms of meeting sustainable goals or getting to sustainable performance, and you might find that one has experienced something similar, is able to then share how they worked around that, how they surpassed that challenge, and there's learning from one party to another that takes place in those discussions and collaborations"* 14:12 ¶ 113 in 5 OTCOX
CONCE1: *"So, I believe that the key to successful collaborations is really being, being honest. Honesty amongst the participants with the respect to what they are really trying to achieve is key, and sticking to that as far as possible. Where the changes start to creep in and there is a shift in strategy in order to secure and keep the collaborative relationships going forward, there may need be a need to pivot, but that can happen if communication is upfront and is clear, is straightforward."* 4:28 ¶ 117 in 4 CONCE1
CONCE5: *"Other avenues I've also seen and experienced, ah what do you call these, platforms where industry players get together. For example, the petroleum industry, they do have these sessions where they come together. I know in South Africa there's SAPIA and what they try and do is make sure that on the agenda when they meet on a monthly or quarterly basis, you know, on the agenda are issues of, you know, sustainability and environmental compliance and how as an industry they can work collectively towards, you know, attaining those goals."* 13:10 ¶ 42 in CONCE5
CONCE1: *"So, that collaboration is a multi-party collaboration that really is not just two parties. It's not the brand owner talking to the retailer, it's not the brand owner talking to the*

recycler, it's actually, like I said, almost the full value chain of that recycling having to be in conversation about what's possible with respect to improving sustainability objectives. So ja, and industry bodies are the platform through which such conversations can be held." 4:14 ¶ 66 in 4 CONCE1

5.4.2.2 In-Case and Cross-Case analysis of the Evidence

The in-case analysis was first done within each of the four group of participants and thereafter the cross-case analysis compared the various groups of participants (FMCG vs. CE Consultants vs. Mining and Heavy Industry vs. Packaging Manufacturer).

Many of the participants in the FMCG group had experienced communication as a mechanism of managing the collaborative relationships. They expressed the value of regular interaction amongst the parties and gaining a mutual understanding of the required outcomes. A unique insight from this group was illustrated by FMCBV2, who mentioned technology as a tool to communicate to supply chain partners in real time, which enhances the performance of supply chain partners and the outcomes of the collaboration.

The Packaging Manufacturers group illustrated by PLSMN1 had experienced that constant exchange of knowledge with both suppliers and customers played a role in building and maintaining the collaborative relationships.

The Mining and Heavy industry group, illustrated by OTCOX, mentioned sharing knowledge through industry platforms where practitioners from different sectors could engage and share knowledge and experiences provided learning opportunities to improve collaborative relationships.

Many participants in the Consultants group expressed experience of knowledge sharing through platforms that enable conversation amongst players across sectors as well as across the value chain. There was a unique insight as illustrated by CONCE1 who emphasized clear, upfront and honest communication as key to managing the collaborative relationships and ensuring longevity even through stages where there may be shifts in individual company strategies.

5.4.2.3 Conclusion on Communication

All the four participant groups emphasized that in their experience a constant flow of information, knowledge sharing or regular communication between the supply chain partners played an important role in the success of the collaborative relationships.

The CE Consultants and Mining and Heavy Industry had experienced the value of industry platforms that were used to communicate and share knowledge and learnings

across industries or within a specific sector.

There were two unique insights within the participant groups; the first being the FMCG participant group who had experienced the role of technology enabling real time communication and therefore enhancing the performance of supply chain partners and thus the outcomes of the collaboration. The second was within the CE Consultants group who expressed that the clarity of communication and honesty played a key role in the longevity of collaborative partnerships.

5.4.2 Research SubQ2: Theme 2 – Willingness to Capacitate

Only three of the four participant groups mentioned willingness to capacitate supply chain collaboration partners as part of managing the collaborative relationships. There was no mention of this theme by the Packaging Manufacturing group of participants.

5.4.2.1 Evidence of Willingness to Capacitate

RQ1 SubQ2 Theme 2 - Willingness to Capacitate
FMCBV4: *"I think my experience so far has been... I think it's a journey, it doesn't happen overnight, I think we're all holding each other's hands, because it's all new."* 7:12 ¶ 110 in 13 FMCBV4
FMCBV3: *"in terms of capabilities sometimes do also have to be prepared to take a partner on board where you both learn together"* 8:22 ¶ 144 in 8 FMCBV3
FMCBV1: *"And we do know that most of our BEE partners might not have reached where we want them to be, and hence, we need to assist them to reach so that we are able to proudly report on that, or make sure that they are also sustainable as well, whether it is packaging material, whether it is plastic, whether it is diesel usage, et cetera, those type of things."* 11:11 ¶ 65 in 1 FMCBV1 38m
OTWAT: *"we gave them an audit report for them to do, with recommendations for them to implement the recommendations and we gave them time to do that but when they were not doing that then we went back and we met with them to find out why are they not doing that and certain things they can't do and so forth so then we went back to them and said okay if you can't do a b and c, we'll come in and assist you, and train you on how to do a b and c properly so that you do it for us"* 15:28 ¶ 159 in 7 OTWAT
OTWAT: *"the capabilities are low, what we even had tried to intervene and help with, was to train them and to provide them with the skills to do that job that we had appointed them for. Can you see the dilemma there? Like it becomes an issue so when your customer has to train you to service them."* 15:12 ¶ 49 in 7 OTWAT
CONCE5: *"That's one aspect but also building capacity. We do prioritize, you know, building capacity, building awareness first of the different players across the value chains."* 13:27 ¶ 115 in CONCE5

CONCE2: *"But there are other tools, things like customer relationship management tools, there are carbon exchange mitigation management and measurement tools, there are tools in terms of looking at driving efficiency with regards to logistics and materials, there are tools and guidelines for example in lean manufacturing. There are a number of different ways one can look at utilizing different tools for each person in that supply chain to be able to achieve what they need to do"* 10:15 ¶ 97 in 9 CONCE2

5.4.2.2 In-Case and Cross-Case analysis of the Evidence

FMCG group participants stated that the transition to a circular economy was something new for everyone involved therefore it was important to hold each other's hands and learn together. All the FMCG participants expressed their experience of willingness to learn together. The emphasis was on recognizing that most developments would be new, and no one was expected to know or have the experience therefore where the lead firm was in a position to impart knowledge it was to the benefit of the partnership to do so, and this aids the transition. A unique experience was highlighted by FMCBV that specifically referred to BEE partners who were prioritized for opportunities however may not have reached the required level of sustainability. To balance this social aspect with business imperatives it was important for the focal firm to assist them to reach the required levels and not just exclude them.

Mining and Heavy industry stated they had experienced situations where after an audit of the performance of a supplier and recommendations for improvement, it became apparent that the capabilities to deliver were low, however the lead firm took it upon themselves to train the supplier and capacitate them to be able to deliver. This indicates the entrenchment of partnership relationship and difficulty to switch where the best option becomes to rather train the supplier that has been appointed.

The Consultants group shared a distinct experience (by CONCE5) in that building capacity and awareness across the value chain was important in capacitating partners or potential partners. A distinct insight was shared by CONCE2 who specified the utilization of technology like customer relationship management (CRM) tools, carbon management/measurement tools etc. to drive efficiency for each person on the supply chain to achieve their objectives. There was a willingness to leverage tools and technologies to enable the learning and capacitating all stakeholders in the collaboration.

The three groups of participants insights had nuances of difference where the FMCG

group recognized this is a new filed and all parties have an element of learning required and it is best to learn from each other. The Heavy industry group experience was the lead company providing the training to its partners and not necessarily mutual learning. Participant FMCBV1 was similar to the Mining and Heavy industry group in this sense regarding upskilling of BEE partners in their sustainability performance. The Consultants group insight was in building awareness and capacity across the value chain, similar to the FMCG group. A distinct experience from the Consultants group was the role of management and measurement tools that could be shared and used to improve efficiency of each partner to deliver.

5.4.2.3 Conclusion on Willingness to Capacitate

The key insights emerging on this theme of willingness by the lead or focal firm to capacitate supply chain partners was that transitioning to a circular economy was a new field and therefore finding a fully capable partner was unlikely. The FMCG group expressed mutual learning where partners must be willing to assist each other and learn together whereas the Mining and Heavy Industry group emphasised the lead firm capacitating its suppliers. The FMCG and Consultants groups recognised the value of building awareness and capacity across the value chain and therefore saw this training and capacitation as an investment in the transition.

There was also recognition of the local South African context for social inclusiveness laws like BBBEE. In instances where the BEE partners were not at the required level of sustainability performance, the experience of participants was to assist them to reach the required level.

Further, capacitating suppliers with technology or tools for customer relationship management, carbon management and measurement as well as lean manufacturing was experienced to drive efficiency and assist each partner to achieve their deliverables. The Mining and Heavy Industry group shared an experience that a willingness to train existing partners eliminates the need to switch after a relationship is established. It is more beneficial to maintain the same partners and capacitate the to deliver. This demonstrates the entrenchment of a partnership relationship in supply chain collaborations for a circular economy.

5.5 Research SubQ3: Barriers and Enablers of Transition to CE

The sub-themes under barriers are discussed first, followed by the sub-themes under

enablers to the transition to a CE.

Table 15: Themes emerging from RQ1 SubQ3

Theme	Similarities	Differences	Nuance of difference	Discussed (Yes/No)
	Existing theme	**New theme**	**New subtheme**	
Barriers to Collaboration				
○ Lack of trust	X			NO (No data)
○ Lack of transparency	X			NO
Barriers to Transition				
○ Lack of legislation	X			NO
○ Cost			X	Yes (Insights)
○ Lack of coordination			X	Yes (Insights)
Enablers to Collaboration				
○ Long term commitment	X			NO
Enablers to Transition				
○ Organisation mindset and culture	X			YES (Insights)
○ Global Frameworks			X	YES (Insights)
○ Advocacy			X	YES (Insights)

Table 16: Frequency and main topics on Research SubQ3 (Barriers and Enablers)

	Group FMCG	**Group Packaging manufacturing**	**Group Mining and Heavy Industry**	**Group Consultants**
Lack of coordination *Topics*	Many *Linear thinking* *Profit vs sustainability*	Many *Silos* *Hidden agendas* *Broken waste management*	Low or none	Many *Different speeds* *Global vs local transition* *Profit vs sustainability*
Cost *Topics*	Many *Assumed expensive* *Suppliers exploit first mover*	Many *Value vs. circular outcomes* *Low scale increases costs*	Low or none	Many *Incentive to reduce cost* *Hidden costs are the business case*
Organisation mindset and culture *Topics*	Many *Build culture over years, Leadership sponsor, Leverage brands*	Many *Leadership sponsor, Leverage brands* *Align strategy*	Some *Long term impact mindset* *Sustainability embedded*	Low or none

Global Frameworks *Topics*	Some *Anchor language* *Access to best practice*	Low or none	Low or none	Low or none *Pre-assessment* *Priority areas*
Advocacy *Topics*	Low or none *Consumer education*	Many *Pressure from consumers* *Public education*	Some *Effects of climate change*	Many *Effects of climate change* *UN YSI initiative*

5.5.1 Research SubQ3: Barriers Sub-Theme 1 – Lack of coordination

The various participants had diverse experiences of this theme. Although most had experienced a lack of coordination as a barrier both to collaboration and to the transition towards a CE, the individual experiences were quite unique both within the groups as well as cross-case. It was observed that no mention of the lack of coordination as a barrier from the Mining and Heavy Industry.

5.5.1.1 Evidence of Lack of coordination as a Barrier

Research SubQ3 Barriers Sub-Theme 1 – Lack of coordination
FMVAR2: "*We acknowledged that we could work in the manufacturing environment, but when you manufacture plastic packaging, your goal is to supply as much as possible as that delivers the most money and the most profit. You don't want to be on a sustainability journey where everybody is saying, "Now we must get rid of plastic", and you as a plastic manufacturer, you say, "Ja, no, we should do that", because it's just going to affect your bottom line.*" 19:1 ¶ 21 in FMVAR2
FMVAR2: "*And that, unfortunately, you sit with price increases, you sit with not everybody's aligned to it, so it's like pushing water uphill sometimes. That's how difficult it is. It's like going into a forest and a bush with a sword that's blunt, you've got to chop your way through it. So, those are the challenges when you want to integrate into a sustainability system in the current landscape. It's the linear thinking.*" 19:26 ¶ 178 in FMVAR2
FMCBV1: "*sustainability is so big because it's got 10, almost 11, sustainability spheres, and I'm only going to be focusing on environmental, not the other stuff, because that's what I deal with.*" 11:6 ¶ 58 in FMCBV1
PLSMN2: "*The challenges is, there's different groupings doing the same sort of things, and they're not necessarily talking to each other.*" 18:23 ¶ 104 in PLSMN2
PLSMN2: "*The problem is, and I'm coming back to my earlier statement, is that there's so many different discussions taking place by different groups, and those groups don't talk to each other*" 18:18 ¶ 90 in PLSMN2
PLSMN2: "*I think there's too much personal, hidden agendas in discussions, which doesn't really make it real collaboration. It's, "How can I convince you to what I think is the right thing to do?*"" 18:16 ¶ 78 in PLSMN2

PLSMN2: "*Two simple statements around that is we sit with a broken system in terms of waste management services in South Africa, so that is a big, open gate that allow plastics to enter into the environment.*" 18:2 ¶ 42 in PLSMN2
CONCE5: "*So the different stakeholders they implement at different levels, so you find that your [large retailers] can go green, for example, the plastic, you know, eliminating of plastic waste, you know, that initiative, you know, some organisations can adapt quickly and remove then come up with replacements but others are slower so that tends to sort of frustrate progress from a supply chain perspective because ultimately you want everybody to be committed and working towards the same drive so it becomes a challenge.*" 13:25 ¶ 103 in CONCE5
CONCE2: "*understanding that while we think these are big changes that are happening on a global perspective it affects our own companies, our own big corporations and big brands who are globally linked, if affects their supply chains because they supply into that chain and they need to be compliant with those requirements. So even though the strict principles from a trade perspective in Europe would have a long effects into our own local supply chains at the very, very SME level.*" 10:23 ¶ 127 in CONCE2
CONCE2: "*And then ultimately looking at the final outcome is understanding the opportunities of a transition to a sustainable future versus the current status quo where there are vested interests trying to maintain an unsustainable future because they have invested heavily.*" 10:19 ¶ 115 in CONCE2

5.5.1.2 In-Case and Cross-Case analysis of the Evidence

The lack of coordination of efforts towards the transition was expressed by many of the participants in the CE Consultants, Packaging Manufacturers as well as the FMCG group. There was no experience shared of this theme in the Mining and Heavy industry participants group. The Consultants group had diverse experiences on the lack of coordination. A unique perspective as illustrated by CONCE2 who stated that the (legislative and technology) changes on a global scale ultimately affect local supply chains. This was due to these changes impacting big local brands who are globally linked because they supply into those supply chains and must therefore comply. The strict changes in Europe for example have far-reaching effects into the local supply chains thus affecting even local SMEs who supply to the big brands. CONCE5 shared that the implementation of circularity by stakeholders at different paces was a challenge for the transition. For example, the initiative to eliminate plastic waste, the large retailers can adapt quickly and find alternatives, but smaller retailers move slowly and thus frustrate the progress from a supply chain perspective, which is interlinked. In an ecosystem all stakeholders must be committed with the same drive. CONCE2 also shared an experience of lack of coordination from the perspective of some industry players having vested interests in historical investments thus needing to maintain some unsustainable

existing businesses or products, ignoring the opportunities presented by a transition to a sustainable future.

In the FMCG group, FMVAR2 shared a similar experience to the Consultants' (CONCE2) in stating the goals of plastic manufacturers would never be aligned with sustainability goals that say get rid of plastics as this ultimately affects their business profitability. A dissimilar experience within the FMCG group was that due to linear thinking and a lack of coordination, circular supplies were still a niche product which meant the early movers then had to pay a premium price. The suppliers were not aligned in transitioning and will penalize those requiring small production runs for more sustainable options.

The Packaging Manufactures participant group's key insight was regarding uncoordinated efforts of the stakeholders in the supply chain, particularly at the end of life, PLSMN2 stated that the waste management system in South Africa was broken and was a big open gate that allowed plastics into the environment. Even with the best designs of biodegradable or recyclable packaging, if the waste collection remained inefficient, waste would still land up in the landfill which defeats the purpose of circularity. Further, there were diverse groups within the sector who were doing the same thing but not necessarily talking to each other and not coordinating those efforts. PLSMN2 also mentioned similar experience as the FMCG (FMVAR2) and Consultants (CONCE2) group that there were personal hidden agendas where some businesses sought to protect their own turf and convince their supply chain partners to drive a particular agenda which was not aligned to a sustainability agenda.

5.5.1.3 Conclusion on Lack of coordination as a Barrier

The experience businesses working having hidden agendas in protecting their legacy investments and circumventing sustainability was expressed by the various groups including the Consultants and the FMCG groups. The Packaging Manufacturers participant group's key insight was that the efforts of supply chain role-players were not coordinated, particularly regarding the end of life of products. The waste management system in South Africa was said to be inadequate in keeping plastics inside the loop and out of the environment. This made redesigning of packaging to biodegradable or recyclable redundant as waste would still end up in the landfill which defeated the purpose of circularity. Another example of uncoordinated efforts given was various industry organisations were running similar initiatives but not talking to each other.

A unique perspective from the Consultants' group was that the changes on a global scale ultimately affected local supply chains. The changes impact big local brands who are

globally linked because they supply into those supply chains and must comply. The strict changes in Europe for example had far-reaching effects into the local supply chains thus affecting even local SMEs how supply to big brands.

5.5.2 Research SubQ3: Barriers Sub-Theme 2 – Cost

The various participants had diverse experiences of cost as a barrier to transitioning to a CE. The cost as a barrier to transition was mentioned many times by three of the participants groups being the FMCG, the Packaging Manufacturers and the CE Consultants groups. Within each of the groups there were diverse experiences as well as across the groups. One similar experience between the three groups was also observed. There was no mention of cost as a barrier to the transition by the participants in the mining and Heavy Industry group.

5.5.2.1 Evidence of Cost as a Barrier

Research SubQ3 Barriers Sub-Theme 2 – Cost
FMCBV2: *"You also get, like I said earlier, that funding, and financing aspect that can present quite a difficult challenge, and it's part of a continuity of funding. I think that is a challenge that impacts any sustainability instrument."* 3:47 ¶ 101 in FMCBV2
FMCBV2: *"Whether it is the capex requirement from new renewable energy, or biomass installed in a factory, or whether it's the, I'd say, access to arable land for your smallholder famer, whether it's market access platforms that need to exist within small to medium enterprises to be able to showcase their unique value proposition, these are different little aspects that can and do present challenges to sustainability initiatives."* 3:48 ¶ 101 in FMCBV2
FMCBV3: *"The second challenge is that people think that it will cost money, which it does but it's often not as much as people think it would be so a key challenge is to get the finance team on board"* 8:32 ¶ 170 in FMCBV3
FMCBV1: *"I can say, "Okay, let's go for a company that is more sustainable." And then, procurement will tell me, "Oh no, but that is more expensive.""* 11:10 ¶ 64 in FMCBV1
FMVAR2: *"here are some times when we just can't, where the packaging is just more expensive because there's just so little people asking for this. Then we have to say, "Okay, we want to do this. We have to put this in place. We're going to have to pay a little bit of extra.""* 19:31 ¶ 204 in FMVAR2
FMVAR2: *"So, the moment some suppliers and some people hear that you're on a sustainability journey, the price unfortunately still tends to go up. They say, "Oh, you want to do good? Well, you see, not everybody wants to do good. You're the only one that wants to do good, so because your volumes are so small, because your ideas are so unique, because you are ahead of your time, we're going to do this especially for you. And because we're doing it especially for you, the price is going up.""* 19:25 ¶ 170 in FMVAR2

FMVAR2: *"That kind of circular thinking is not commonplace, and that's one of the biggest challenges, and with that comes increases, lack of support, it's difficult to get to your end goal because you've got to lay out a lot more cash. The journey is slower."* 19:27 ¶ 180 in FMVAR2

PLSMN2: *"No waste picker will pick that up, because there's no value in terms of least effort for most value. It's compacted, it's dirty, compostable material, if it's in a landfill, it will not become compost."* 18:10 ¶ 60 in PLSMN2

PLSMN1: *"However, obviously with sustainability, one of the biggest barriers, so to speak, is the increased costs, because these products aren't being produced on the same economies of scale as some of the less sustainable options"* 17:4 ¶ 34 in PLSMN1

PLSMN1: *"I think in terms of the cost, it's obviously the mills and us, we're looking at ways that the sustainable products become the more run-of-the-mill, so to speak, so that through economies of scale, these sustainable products become more affordable."* 17:28 ¶ 201 in PLSMN1

CONCE3: *"I think the number one inhibitor is cost, because and I'm talking from a corporate perspective now. Your corporate procurement office is very often incentivized by cost reductions. Everybody wants to improve their positive draws, they want to reduce their operational costs, so there's a massive pressure that then comes into that supply chain environment around cost."* 5:23 ¶ 77 in CONCE3

CONCE5: *"like I mentioned earlier on sustainability comes at a cost so it calls for us to commit resources financially, technically, maybe upskilling on, you know, of our staff etcetera and those cost implications then I think then become problematic for the value chain from a sustainability perspective."* 13:24 ¶ 101 in CONCE5

CONCE3: *"And unfortunately, in a number of areas, particularly if you're wanting to innovate around sustainability, because technology in some of those areas is still catching up, or might not be readily locally available, it doesn't always come at an equal cost to perhaps an old practice."* 5:24 ¶ 77 in CONCE3

CONCE4: *"So it's about showing where the hidden costs are, so what's really important especially from a waste perspective, people often just talk about the waste service provider and their cost but when you start showing people the fact that, so at the end of your manufacturing process you've got all this waste going to landfill or being recycled and it's costing you X amount of money but when you start factoring the fact that you've lost raw material."* 6:19 ¶ 148 in CONCE4

"So how much that raw material costs that's not sitting in a skip how much labour time did you use to put that material in the skip, how much electricity or energy went into it that you now putting into a skip and you put a cost to that and including water, time, productivity, all that kind of stuff. You basically see that your waste cost isn't just the waste service provider fee, its quadruple that because now you've taken all of those are the costs into account and that's when people start realizing, okay I see that it's actually not just that gate fee anymore or that cost to move it off my site. There is a much bigger cost and potential opportunity." 6:20 ¶ 150 in CONCE4

5.5.2.2 In-Case and Cross-Case analysis of the Evidence

There was a diversity of experience within the FMCG group of participants. FMCBV1 and FMCBV3 had experienced internal departments being averse to an increased cost that was assumed to be associated with sustainability initiatives. The finance team would always assume it to be more expensive than it actually is, similarly, the procurement department were averse to innovations as they assume it would cost more FMCBV2 had a nuance of difference in that they had experience that often there are capital expenditure

requirements for renewable energy or installation of a biomass system at a factory of which access to funding was a challenge. A vastly different experience within this group was expressed by FMVAR2 who had experienced that some suppliers would exploit a first mover into sustainable products on the knowledge that the organization is committed to doing good and would therefore pay, the price would therefore be increased and justified as due to the lower volumes and niche ideas that are required ahead of other customers being serviced.

The Packaging Manufacturer group expressed one similar experience to the FMCG group (FMVAR2), as illustrated by PLSMN1 who had experienced that sustainable products are produced at a small scale of economies and this drives the cost up. PLSMN1 further added that collaboration by packaging suppliers with the mills would improve affordability through increased scale economies. The other diverse experiences were PLSMN2 who experienced that waste pickers were motivated by the value they received from what they collected compared to the effort of picking. This is a barrier to achieving circularity because waste remains in the environment as a result, waste pickers are not motivated by that outcome of keeping waste out, rather the cost vs. remuneration of their efforts.

The experiences within the CE Consultants group were diverse. An experience similar to the FMCG group (FMCBV2) was expressed by CONCE5 who stated that the sustainability initiatives come at a cost. The nuance of difference was that CONCE5 further added that in addition to the financial resources committed to an initiative, the upskilling of staff also had cost implications which becomes problematic to implementing sustainability in the value chain. A further similarity o the FMCG group (FMCBV3 and FMCBV1) was illustrated by CONCE3 that the procurement office was incentivized to reduce costs and therefore the number one inhibitor for sustainability was the costs as the pressure on the supply chain to reduce costs inhibits implementation of the transition to circularity.

A contrasting experience regarding costs as a barrier to the transition was expressed by CONCE4 who stated that in their experience the circular solutions do not actually cost more, the issue were the hidden costs that organisations do not take into account. For example, the actual cost of waste was not the gate fee paid to the service provider but the lost raw material, energy inputs, labour time and utilities that went into its production. CONCE4 further added that circular thinking could eliminate this waste (and costs) therefore the hidden cost would be the business case for sustainability.

5.5.2.3 Conclusion on Cost as a Barrier

The inherent (perceived) additional costs associated with sustainability initiatives was expressed as a barrier to the transition to circularity. This was expressed by the FMCG and the CE Consultants groups, who stated that the internal departments of finance or procurement were incentivised to reduce costs and were averse to sustainable options as they assumed cost would be higher. The experience of the CE Consultants regarding the inherent additional costs was the mention of further financial requirements for upskilling staff which limits sustainability improvements for the value chain.

The low economies of scale were experienced as a driver of increased costs as expressed by both the FMCG and Packaging Manufacturer groups. A nuance of difference was that the FMCG groups experience was that suppliers exploit the first movers who have niche requirements compared to their peers through the price increases. Collaboration by packaging suppliers with mills was experienced to increase the scale economies and improve affordability of sustainable options.

A unique experience of the Packaging manufacturer was that cost as a barrier was experienced through how waste pickers were motivated by the return on their efforts rather than the intended circular outcomes. Therefore, some types of waste would be left behind in the environment due to its low value.

There was a contrasting experience of the costs as a barrier form the CE Consultants group who had experienced that the issue was hidden costs of linear thinking and operating that organisations did not take into account. It was stated that when lost raw material, energy inputs, labour and utilities were incorporated into the cost of waste disposal, this builds a business case for transition to circular business models.

5.5.3 Research SubQ3: Enablers Sub-Theme 1 – Organisation culture and mindset

Most of the participants groups expressed some experience with the organisation mindset and culture as an enabler of transitioning towards a circular economy, with one exception being the Packaging Manufacturers group who did not mention any experience of this sub-theme. Within the FMCG group there were many diverse experiences, and the main topics were building culture over years, having support from leadership as well as leveraging brands for sustainability agenda. Within the Mining and Heavy industry group there were also many diverse experiences, some were similar to the FMCG group with topics such as leadership support and leveraging brands emerging. Further topics were aligning sustainable performance to the brand/product and company strategy. The CE Consultants group had some experience with this sub-theme with topics such as the

long-term mindset and having sustainability embedded in all activities of the organisation.

5.5.3.1 Evidence of Organisation mindset and culture as an enabler

Research SubQ3 Enablers Sub-Theme 1 – Organisation Mindset and Culture
FMVAR2: *"In 2007 when we started our good business journey, it wasn't somebody that sat overnight and thought about it and said, "Hey, tomorrow we're going to start this thing called our business journey." Many years before that we used to work in this way, we were responsible about it, and then we said in 2007, "We're going to formalise this. We're going to give it a name. We're going to call it our good business journey. We're going to set guardrails and guidance for people to work within sustainability. We're going to set goals and targets and visions about our good business journey."" 19:28 ¶ 188 in FMVAR2* **FMVAR2:** *"We've put in place measures with our teams. If you want to launch a new product, you've got to have a circular principle for both the product and the packaging. Don't put palm oil that you bought without oversight. We want responsible palm oil in there. We know where it comes from. We know who's farming it, we know that nobody was affected by the fact that this is the palm oil, we know there's no slavery. So, everything we do, whether it's product, packaging, transport, warehousing, purchasing, it's all got that overriding, guiding principle that is the good business journey"* 19:36 ¶ 240 in FMVAR2
FMCBV1: *"we have quite good leadership in the company that puts sustainability in the forefront. We've got sustainability counsellors, we've got social ethics committees and all that, and though this sustainability stuff is being discussed in those forums at extremely high level, CEO level, and it just shows the leadership commitment. And I really believe that once it's entrenched up, it's like water, it's easy to trickle down to the guy at the bottom."* 11:42 ¶ 189 in FMCBV1
FMCBV1: *"We are trying to be more greener because we are seeing that to be more greener will probably benefit us, and also benefit the business as well in the long term"* 11:24 ¶ 123 in FMCBV1
FMCBV1: *"I think obviously with public image, we want to be associated with companies that also seem to be sustainable, but however, it's got its pros and cons."* 11:9 ¶ 64 in FMCBV1
FMCBV3: *"But product have money and so any product in a fast moving consumer goods space has money attached and a product that is sold to a consumer wants to show that it's sustainable so they become really key partners and you can drive"* 8:19 ¶ 117 in FMCBV3
FMCBV4: *"How do we actually map out those initiatives, how do we taper down to net zero, how do we leverage brands? I even see us... sustainability isn't just like a corporate thing, it's like we've got a portfolio of so many brands from [Beverage 1] to [Brand 2] to [Beverage 3], [Beverage 3]'s obviously known as taking a huge stance on plastic"* 7:45 ¶ 308 in FMCBV4
OTWAT: *"So I think those are the main values that we're seeing and by us doing that, people trust us more"* 15:32 ¶ 171 in OTWAT
OTMIN1: *"you don't want to be creating beauty and harming the environment so you want to make sure that whatever that you bring in, is actually aligned to your ultimate strategy."* 2:9 ¶ 55 in OTMIN1
OTCOX: *"Governing bodies are very, very critical in terms of sustainable performance, because they then set the strategy or the tone, the culture, of sustainability at their level, in terms of their leadership."* 14:4 ¶ 44 in OTCOX

OTWAT: "*Our wastewater treatment works, we've got one here in [Location A]. It's the, I think at some point there was an article that showed that we're the highest emitters of Methane in the [location] so that's not, like we're harming the environment. We saying we're providing for people, taking care of people, we always have all these beautiful CSI initiatives but are we really doing what we're saying.*" 15:3 ¶ 22 in OTWAT
OTMIN1: "*So what I would like is that, you know, sustainability must stop being a responsibility of a certain department which in our case is Corporate Affairs.*" 2:22 ¶ 162 in OTMIN1 "*I would like to see it moving beyond being driven from a department but, you know, everybody knowing that if I just do my little bit in what I'm doing in my specific area of work, this is how it's going to impact, this is how it's going to be sustainable in the future because I think if people that understanding that then it's easier to achieve our goals*" 2:23 ¶ 162 in OTMIN1
OTMIN1: "*So I think having that sponsor actually enabled a lot of processes to start happening better.*" 2:19 ¶ 128 in OTMIN1
CONCE3: "*So, it's an integral part of a company taking accountability for their full impact on the world, and by the world, I mean environmental, people and society.*" 5:6 ¶ 27 in CONCE3
CONCE3: "*So, the last one that I can think of specifically, there was for example the [Big Bike Race], which is one of the world's top mountain bike races. The entire event was designed to have a net zero impact on the environment, because you're going through beautiful, natural landscapes, mountains, farms, communities, et cetera, and there were initiatives that were started that were not just, "Let's take a tin of paint and paint a school", which doesn't make any difference, there were specific initiatives put in place that were intended to be self-sustaining after the event.*" 5:33 ¶ 123 in CONCE3
CONCE4: "*So my expectations is that hopefully one day, we don't have to really prove that business case, that it actually just becomes embedded in what we do.*" 6:3 ¶ 13 in CONCE4

5.5.3.2 In-Case and Cross-Case analysis of the Evidence

The FMCG group expressed diverse experiences with organisation mindset and culture as an enabler of the transition to circularity. FMVAR2 stated that building a culture of sustainability takes many years and they had experienced that an established culture was formalised into a vision and strategy with guidelines and measures in place for circular principles to be embedded in both the product and the packaging development. The guidelines dictated that the entire product value chain must be responsibly sourced and the circular packaging with all inputs responsibly sourced. This was a unique experience that was not mentioned by any of the other participant groups.

Another experience from the FMCG group stated by FMCBV1 was that having good leadership who put sustainability at the forefront enabled long-term thinking and also ensured the organisation collaborates with others who are aligned in that. This further enables the transition through the supply chain relationships. A similar experience to this

was illustrated in the Mining and Heavy industry group by OTCOX and OTMIN1 who both mentioned that a leadership sponsor or governing bodies play an enabling role in setting the strategy and a culture of sustainability in an organisation.

In the FMCG group, FMCBV3 and FMCBV4 expressed that the sustainability drive can be carried beyond the corporate by leveraging the spend and image of brands. The FMCG brands reach consumers who are starting to care more about sustainability thus brands who care about the environment have an appeal. This was a similar experience mentioned by the Mining and Heavy industry group, illustrated by both OTWAT and OTMIN1. OTWAT stated that the more they continue implementing circular practices, the more the public trusts the organisation. Expressing a similar experience, OTMIN1 said that as a diamond miner, the end-product represents beauty and therefore harming the environment would not align with that image. The sustainability performance should therefore align with the product strategy.

The Mining and Heavy Industry as illustrated by OTMIN1 had experienced the role of culture as an enabler and mentioned that if sustainability moves beyond being the responsibility of the Corporate Affairs department only and everyone in the organisation did their bit it would be easier to achieve the goals. This was unique to the Mining and Heavy industry group.

The CE Consultants group, illustrated by CONCE3, had an experience of the company's mindset of long-term impact filtering into how projects were implemented, considering the full impact on the environment and society and also ensuring that even its CSI initiatives were self-sustaining. This was similar to the FMCG group experience illustrated by FMVAR2 that integrating the culture of sustainability into all the company's operations was an enabler of the transition.

5.5.3.3 Conclusion on Organisation mindset and culture as an Enabler

There was a unique insight mentioned in the FMCG group who had experienced that organisation culture and mindset was a journey built over years which was also important to formalise and integrate into the company's way of doing things, from leveraging the brands, examining the product inputs, ensuring its packaging and all inputs into the value chain were sustainably sourced. The Mining and Heavy Industry as well as the CE Consultants group had experienced that the supply chain partners, and their sustainability performance must all be aligned to the vision of achieving circularity. The CE Consultants group further added that having a long-term impact in the mindset of the

organisation ensures that the full impact on the environment and society is considered with all the organisation's activities.

The importance of the organisation's leadership structures setting the tone on sustainability culture was expressed as an enabler by participants in the FMCG as well as the Heavy Industry and Mining groups. The Mining and Heavy Industry group further added a unique insight that a sustainability culture was entrenched when the responsibility moves beyond one department taking the lead to everyone doing their part. The groups expressing this experience were the focal or lead firms who drive the collaborations within their supply chains.

5.5.4 Research SubQ3: Enablers Sub-Theme 2 – Global Frameworks

The use of global frameworks as an enabler of the transition to a circular economy was mentioned many times by the FMCG group of participants. There were different experiences of the global frameworks within the group. There was some mention form the CE Consultants group of participants. No statement of experience with Global Frameworks s an enabler was expressed by the Packaging Manufacturer group or the Mining and Heavy Industry group.

5.5.4.1 Evidence of Global Frameworks as an Enabler

Research SubQ3 Enablers Sub-Theme 2 – Global Frameworks
FMCBV3: "*I made sure, that we were signatories and participants to the UN Global Compact, right because once you become a partner slash participants slash signatory and they have different levels of what that means, you then immediately have access to best practice.*" 8:15 ¶ 103 in FMCBV3 **FMCBV3:** "*I think in terms of collaboration is what I found is to understand global frameworks. Okay because whatever you do you've got to anchor it in business language. If you anchor it in the pink fluffy cloud that everyone sometimes thinks sustainability is, you're not going to get traction.*" 8:14 ¶ 103 in FMCBV3
FMCBV3: "*So I found if you anchor it in some business language like that. Umm and you can link it and you can show which part of what you doing addresses which of these four levers or drivers then you can overcome the challenges better because you're talking the language of the business as well.*" 8:39 ¶ 186 in FMCBV3
FMCBV3: *"…basically they take you through a global view your sustainability and business in society and all the levers and how everything connects and what you should think about and jam, factor in your thinking."*
FMCBV2: "*So again, because we are very a performance-driven company, we're expecting that in each of our pillars we will be able to provide not just achievement of the goal, but verifiable data that confirms the achievement of goal itself. In our climate action, pillar, we actually are hoping to achieve by [2025] that all of our purchased electricity will come from renewable*

resources, and that across our supply chain we'll have a 25% reduction in our carbon emissions. In our circular packaging pillar, we are, aiming achieve that 100% of our primary packaging will be either fully returnable, or it will be made from majority recycled content.
"In our water stewardship, pillar we are committed to ensuring that within our [factories] we will use 2.5 hectoliters of water for every hectoliter of [product] we produce across all of our operations globally, and an even more ambitious target of 2.0 hectoliters of water for every hectoliter of [product] in our high water risk spots. In addition, we have a twofold target for water. Beyond our [factory] gates we're also committing that 100% of our communities that are within these high-risk water sites will also have a measurable improvement in their water availability or quality. And lastly, in our smart agriculture pillar, we commit to achieving 100% of our farmers, or our direct farmers, those who actually contract with us or supply their crops in our value chain, will be skilled, connected and financially empowered."

FMCBV4: *"I don't know a lot about the framework, but the framework has various pillars, so it will look at management systems, it will look at supplier management systems, it will look at leadership, so it has different pillars, and within the different pillars will sit how to manage your suppliers, how to store your supplier information, how to negotiate. Negotiation is such a massive thing, because whilst sustainability is a cause, we're obviously still a profit-making business, so it has to make commercial sense."* 7:24 ¶ 178 in FMCBV4

CONCE4: *"Often you'll find that, especially some of the work I'm doing now, people start with what's called a materiality assessment and that by, you basically talking to your stakeholders directly, both internal and external from operations to a broad range of your suppliers and stakeholders. So sometimes that's like the first step. Yeah I don't if you've heard of materiality assessments?"*

"So materiality assessments are one of the first steps that you can use …
So essentially you get the internal and external and then this gets ranked on a matrix so the different topics you, from all the interviews that you do, you basically identify what are the key topics that are coming through from all these interviews and those go on one of the axes and then you do a business ranking survey as well where we talk to leadership, the leadership team and they rank the topics and then when it's on the matrix you almost get this scatter plot and the top right hand quadrant, if you could picture it, that would basically be where the most material issues are for that particular company to focus on and then essentially your sustainability strategy can be built around those material topics. All of the topics are important but the top right quadrant would be the most significant that you could build on basically."

5.5.4.2 In-Case and Cross-Case analysis of the Evidence

The use of global frameworks as an enabler of the transition to a circular economy was mentioned many times by the FMCG group of participants. There were diverse experiences of the global frameworks within the group, most did not elaborate on the name of the framework that was used by their organisation(s). FMCBV3 expressed the importance of understanding the global frameworks. This participant expressed that they had insisted on their organisation signing up on the UN Global Compact and that this membership provided access to best practice. Further, this participant had experienced that anchoring the language of sustainability around the global frameworks levers/drivers made it more effective to communicate to business that sustainability is not peripheral to

business' core objectives.

FMCBV4 stated that their organisation utilised a framework that included management systems, supplier management and leadership and consisted of different pillars with guidelines on each aspect and this enabled the implementation of collaborations towards circularity.

FMCBV2's experience was that the framework enabled their organisation, which was performance driven, to not only achieve the goals but to have verifiable data to support the achievements. This participant elaborated on the four pillars that they have specific targets for such as climate change, circular packaging, water stewardship and smart agriculture. The similarity with other participants in the same group was that the frameworks provided a guideline on how to manage the various aspects of sustainability initiatives or targets.

There was one mention of global frameworks by the CE Consultants group, illustrated by CONCE4. CONCE4 explained the materiality assessment which was used as the first step on the sustainability journey. This involved identifying the priority areas as determined by the internal and external stakeholders including suppliers, customers, and the organisation's leadership. This allowed an organisation to identify low hanging fruit and which pillars should be prioritised. The similarity in the frameworks discussed by the two groups was that the frameworks provided structure, priority, language, guidelines and best practice for the implementation which then enabled an organisation to start the journey towards sustainability or circularity.

5.5.4.3 Conclusion on Global Frameworks as an Enabler

The use of global frameworks was experienced to provide guidelines and enable the implementation of sustainability initiatives for organisations. Experience of this was shared by the FMCG group as well as the CE Consultants group. The FMCG group shared experience of the UN Global Compact framework enabling their organisations through providing access to best practice and providing the language to communicate sustainability in a manner that business could be more receptive. Within the FMCG group there was experience of how the frameworks provide structure, guidelines and enable progress on targets to be monitored and verifiable.

The CE Consultants group shared experience of how the frameworks were used as a pre-assessment tool for the organisations to identify areas of priority as well as the relevant reporting standards as determined by stakeholders and the organisation's

leadership.

The frameworks were typically the first step on the journey towards circularity and either provided guidelines and structure in target setting or in identifying the areas of priority for the organisation. The groups expressing this experience had the perspective of the lead firms in the supply chain collaborations.

5.5.5 Research SubQ3: Enablers Sub-Theme 2 – Advocacy

The experience of advocacy as an enabler of the transition towards a circular economy was mentioned by all the participant groups. The most mention was from the packaging manufacturers group. The theme of these experiences were similar in that the role of consumers and consumer education in accelerating the transition was expressed.

5.5.5.1 Evidence of Advocacy as an Enabler

Research SubQ3 Enablers Sub-Theme 3 – Advocacy
FMCBV4: *"I see more brands really taking a stance on sustainability, and I see more education to our consumers around it, because I think we all play a part. Not just corporates, but also consumers have a massive part that they can play."* 7:47 ¶ 310 in FMCBV4
PLSMN1: *"And then on the other side, you've got the customers who are going, "All right, we know that there's the need for sustainability now from us, because we're getting pushback from our customers, we're getting pushback in the news saying, 'Oh, look at all these [Brand A] bottles floating in the ocean'". So, there's a pull side from them, but a push side this side"* 17:7 ¶ 58 in PLSMN1
PLSMN1: *"So, in terms of partner selection, again, it's ultimately driven by, as I said, the end consumer, so the pressure that the likes of [Retailer A] and their customers are putting on [Retailer A], and [Retailer B] or [Retailer C] are pushing back."* 17:12 ¶ 99 in PLSMN1
PLSMN1: *"And then I think the thing is, what we've seen lately is, there's a lot more desire from everyone to say, "Are you environmentally friendly, or do you have sustainable options for us? Yes, you can offer us X, Y and Z products, and we're very happy with your supply, but going forward, we need to know what you're going to be doing to implement these things, to tick these boxes, that you are FEC approved, you are ISO-14000, you comply with EPR regulations, your plastics are recyclable, you are not using illegal labour sources, you're not chopping down the Amazon rainforest to make paper.""* 17:13 ¶ 99 in PLSMN1
PLSMN1: *"But unfortunately, looking at the world that it is, and human behaviour as it is, which is one of the biggest blockers to sustainability, is consumer behaviour and buying patterns, and understanding what is recyclable, what is being educated on that... I mean, a lot of my friends don't know half the time what a label means."* 17:44 ¶ 278 in PLSMN1

"So, I think it's just a lot of it is gonna come down to consumer education and public education about how to responsibly deal with the various products that we are using, and not just discard them in a haphazard way." 17:45 ¶ 284 in PLSMN1
PLSMN1: *"We need to be wiser as consumers, because ultimately we are responsible as consumers at the end for creating that backdraught, just that second part of the circular economy. Because if we don't dispose of things that are recyclable in the right way, and you throw that in your normal trash, now that's gonna go on the back of a dump truck, and that's gonna get squashed, and no waste picker is gonna go through landfills looking for that type of stuff"* 17:42 ¶ 273 in PLSMN1
PLSMN1: *"If all your recycling stuff is in the same place, they can at least take that bag and then sort it out later, and they can take what they need to. But at the moment, ja, it's gonna take time, and it's gonna be frustrating, but I guess if we can change it community by community and at least get schools to have desks and chairs and those type of things, that's a step in the right direction at least."* 17:43 ¶ 275 in PLSMN1
OTCOX: *"I think we will all becomes so environmentally conscious at some point when we recognize what global warming is, what climate change is, and when we physically feel the impact in our personal spaces, we'll start taking it seriously that we need to be more environmentally conscious. So, I think it's going to not even be something that is legislated, but voluntarily."* 14:29 ¶ 213 in OTCOX
OTCOX: *"Because if you think about it just as a citizen, a global citizen, you don't want to leave future generations with nothing to consume. You don't want to leave future generations with water that is contaminated, they can't use. So, it then just becomes, I think, naturally embedded in all of us to make sure that we are environmentally responsible, and it then spins off to businesses, or the corporates that we find ourselves working within."* 14:28 ¶ 212 in OTCOX
CONCE3: *"I think initiatives like the UN, the Young Sustainability Innovator Program, so that's something that I've been involved with as a mentor, I think those are interesting programs that allow some rethinking to emerge in businesses. But the business already has to be, shall I say, pro-sustainability for those kind of initiatives to have an impact"* 5:30 ¶ 93 in CONCE3
CONCE2: *"just transition in terms of water, energy and food infrastructure that creates a transformative approach where we look at and ensuring that communities and people become part of the process going forward to create that sustainability."* 10:1 ¶ 28 in CONCE2
CONCE5: *"I think with the help of the know these, you know bringing climate change into the conversation, the help of the erratic, the weather the storms, the floods, I think that is driving us to think about the driving forces behind and how our actions are contributing towards these climate change and all of these other disaster that are taking place."* 13:37 ¶ 145 in CONCE5

5.5.5.2 In-Case and Cross-Case analysis of the Evidence

The FMCG group, as illustrated by FMCBV4 expressed that brands were taking a stance in educating consumers about the circular economy and there was an expectation that consumers would start taking an interest and playing a role, in addition to corporates in pushing the transition. The Packaging Manufacturer group, illustrated by PLSMN1 expressed a similar experience of pressure coming from the end consumers. As a

supplier they had also had more customers (lead firms) demanding sustainable options as well as overall environmental compliance, responsible sourcing beyond just delivering the right product specification. PLSMN1 also expressed that human behaviour and buying patterns were the biggest barrier and that public education would unlock an enabler as consumers were responsible for creating a circular economy if they understood what was recyclable and disposed responsibly.

The Mining and Heavy Industry group, illustrated by OTCOX stated that now that consumers can feel the physical impacts of climate change in their personal spaces, environmental consciousness would come voluntarily. This would spin off to corporates and thus ensure that future generations were not left with a polluted environment and diminished resources. The CE Consultants group expressed a similar experience that the erratic weather patterns and floods were creating conversation and stimulating thinking about the driving forces and how human actions were contributing and this was driving a behaviour change.

A different and unique experience expressed by CONCE3 was the influence of the UN YSIP (Young SDG Innovators Program) which allowed rethinking about sustainability in business, although a prerequisite was that the business should be pro-sustainability to start with for this program to have an impact.
The similarity in all the four groups' experiences was the growing awareness and important role of individuals in driving the transition to circularity through advocacy as consumers and putting pressure on brand owners and retailers as well as advocating within the organisations they work in.

5.5.5.3 Conclusion on Advocacy as an Enabler

All four groups expressed having experienced advocacy as an enabler of the transition towards a circular economy. The similarity in all the four groups' experiences was the growing awareness in individuals and the important role of individuals in driving the transition to circularity. Individuals could influence as consumers through advocacy as consumers and putting pressure on brand owners and retailers as well as influence change through advocating within the organisations they worked in. This was largely driven by direct experiences of recent adverse weather events that had made individuals think and talk about the root causes of climate change. There was an insight from the Packaging Manufacturer group stating that public education would empower consumers to drive the transition as well as bring awareness about recyclability and how to dispose packaging responsibly.

A different and unique insight was illustrated by the CE Consultants group regarding the influence of the UN Young SDG Innovators Program which allowed rethinking about sustainability in businesses, which generated advocacy and could be an enabler given the prerequisite that the business had a pro-sustainability culture to start with for this program to have an impact.

5.6 Research Question 2 : Contribution to sustainable development outcomes

The theme emerging with key insights under the contribution to sustainable outcomes was the social outcomes. This is the theme that was selected or discussion in this section.

Table 17: Themes emerging from RQ2

Theme	**Similarities**	**Discussed (Yes/No)**
	Existing theme	
• Long term objectives	X	NO
• Environmental preservation	X	NO
• Economic outcomes	X	NO
• Social outcomes	X	YES Insights

Table 18: Frequency and main topics on RQ2

	Group FMCG	**Group Packaging manufacturing**	**Group Mining and Heavy Industry**	**Group Consultants**
Social outcomes	Many	Low or none	Many	Some
Topics	*Local social context Partner up the value chain*		*Community benefit Reskilling, jobs and skills*	*Partner up the value chain*

5.6.1 Research Question 2: Theme 1 – Social outcomes

Many participants from the FMCG group and the Mining and heavy Industry group mentioned social outcomes as a contribution of the CE transition. There was some mention from the CE Consultants group and no mention from the Packaging Manufacturers group.

5.6.1.1 Evidence of Social outcomes

This theme was selected for analysis due to the unique insights gained from the participants experiences which contributes to a deeper understanding of the phenomenon. The experiences of the participants regarding the social outcomes of transitioning to a circular economy were unique and emphasized the local context of each participants environment. The social outcomes were mentioned many times by the FMCG group as well as the Mining and Heavy Industry group of participants and some mentions by the CE Consultants group as well as the Packaging Manufacturer group of participants.

Research Question 2 Theme 1 - Social Outcomes
FMCBV3: "*Well the one thing is that social compliance is now embedded into this [The ABC company], which is one third of the South African market. Umm and human rights and responsible sourcing.*" 8:40 ¶ 192 in 8 FMCBV3
FMVAR1: "*so even like not just the collection but the fact that we have assisted with moving some of these partners up the value chain and into processing and creating that flow through from processing back into our packaging*" 1:53 ¶ 185 in FMVAR1
FMVAR1: "*in Africa, is the double benefit of, you know, you're not just doing something for the environment, there's also the livelihoods elements and improving livelihoods and one of the things I personally am passionate about is ensuring that we look at these different models for social and economic inclusion.*" 1:56 ¶ 212 in 1 FMVAR1
FMCBV2: "*In terms of our circular packaging, we're constantly looking for partners to return waste streams, to be able to empower retailers, to be able to empower waste collectors. We've set up one very successful, post-consumer waste collected collector project in [Country Z] called [123] that runs now independently, where waste is collected, and it's all different types of collected waste. It is sorted, separated and sold downstream, that generates the continuous income streams*" 3:57 ¶ 145 in 3 FMCBV2
FMCBV2: "*We, we're trying to integrate the local context, and understand what that means, but we know these overarching goals, and that's ultimately what we're trying to achieve by 2025.*" 3:4 ¶ 39 in FMCBV2
PLSMN3: "*Sure, supply chain collaboration. So for us, a big one is localised supply. So we try, where possible, to find solutions that would be locally based.*" 20:2 ¶ 25 in PLSMN3
PLSMN3: "*So I think what that does, is that offers business opportunities and entrepreneurial opportunities for the recyclers and that certainly huge opportunity for job creation in this country.*" 20:32 ¶ 112 in PLSMN3
PLSMN3: "*So to be honest if I was starting out as a student now, I'd be getting involved in waste management because there's a lot of money to be made and some fantastic business opportunities.*" 20:33 ¶ 112 in PLSMN3

OTMIN1: *"We not just this mine that's actually producing this much diamonds and ruining your roads and all of this stuff. It's about something more and how then do you contribute you know putting back the responsibility to the communities how do you contribute towards us like being forever in this place so ja"* 2:25 ¶ 168 in 10 OTMIN1
OTWAT: *"Okay so the outcomes I would say we've seen some social value subsequently that said, social value because in the projects that we have been involved in, we always try make sure that the community benefits somehow with a, benefits through employment or benefit through skills."* 15:30 ¶ 167 in 7 OTWAT 39m12s
OTMIN1: *"So that means that a certain number of people would meet with the communities on a monthly basis so it's different frequency for different groups but it's about educating them to say, you know, what are we all about, you know, how do we help you to move from this status to the next one, how do we create more opportunities together in the community."* 2:17 ¶ 124 in 10 OTMIN1
OTMN2: " *"I think that what the expectation was, was for both parties to be happy at the end of the closure. So, it was around, for me as an organization, I need to make sure that, from a liability perspective I'm covered, but to also make sure that my contractors, they've got jobs. If they are employees that we are setting off or letting go of, we try to upskill them so that they can find other work outside of mining, so that they're not put in a difficult position. So, the outcome was, at the end of it all, no one leaves thinking that they were jeopardized in the process, that it was a fair process of conversation, that they can look back and say, "Yes, the mine closed, but from a legacy perspective, I still have a job, I can still point back to say, 'This is what I've achieved at being part of that mine.''* 16:1 ¶ 37 in OTMIN2
OTMIN2: *"because we've understood that beyond our existence we need to make sure that the communities are able to stand without us. We training people in the community to have driver's licenses. That has nothing to do with us, but we are saying, "How do we upskill the community?" So, I think the learnings from the closure of one mine helps us preempt the closure of another, but saying, "In the process of getting there, how are we still investing back so that we just don't wait for closure, and we find other ways of upskilling these individuals or the community beyond our mine life?'"* 16:24 ¶ 197 in 14 OTMIN2
OTMIN2: *"So, it was just to set everybody up, even the contractors that we were not able to take on beyond closure, it was to say, "How do we help you get other projects so that you don't feel like this is the end?""* 16:2 ¶ 39 in OTMIN2
CONCE4: *"And what was really cool about this project is that, the same waste ambassador stayed on with us for almost a full twelve months, which was incredible and they really were fundamental to the project actually working. So they helped with doing some training, they helped with doing waste characterizations and they left with a whole host of different skills at the end and I think some of them still actually contracted to the municipality."* 6:23 ¶ 178 in 12 CONCE4
CONCE4: *"And part of the circularity was the education and the social change that came with that particular project, in that people saw things differently, they, especially, even the waste ambassador saw that they could actually, they had more power and more control over what they*

did and potential opportunities of what they could do with the recyclables or their food waste and actually start growing produce even at home." 6:25 ¶ 186 in 12 CONCE4
CONCE4: *"We essentially funded these trailers, and basically it was an attempt to get more formalized collection of waste across various substrates, so plastic, glass, metal, tins, so everything, and start to get some of those guys... start them off with the packaging facility, and then look at, as they scale, helping them get into the downstream or upstream parts of the value chain where they can pelletize or grind the material, and pelletize it, and add value to it, essentially to then get better pricing for those products."* 4:47 ¶ 175 in 4 CONCE1

5.6.2.2 In-Case and Cross-Case analysis of the Evidence

The FMCG group as expressed by FMCBV1 had experienced the embeddedness of social compliance, particularly within the South African context. The participant had experienced collaboration for a CE elevated the prioritization of human rights as part of responsible sourcing in the supply chain. This means interrogating the practices of supply chain partners on their practices related to social fairness and equity, leading to social outcomes. Further, FMVAR1 had experienced in the African context that improving livelihoods as well as economic inclusion played a key role in designing the models for the transition to circularity particularly, bringing partners up the value chain.

In the Mining and Heavy industries group there were diverse experiences. Two participants (OTWAT and OTMIN1) experiences were planning for and ensuring that social outcomes were achieved through ongoing collaboration activities of the transitioning. Whereas another (OTMIN2) experience was at closing the loop end where the economic activity of the mine was complete, and part of the restoration included reskilling the community to ensure continued livelihoods beyond the mine.

The Packaging Manufacturers group, as illustrated by PLSMN3 had experienced that localization of supply chain inputs contributed to job creation and the new solutions required for recycling and waste management in particular created business opportunities and job opportunities which were much needed in South Africa.
The experience of the CE Consultants group as illustrated by CONCE4 was that of upskilling and bringing the supply chain partners (waste collectors) up the value chain and ensuring they had improved livelihoods.

Comparing the FMCG group and the CE Consultants group, there were similarities in the experience of bringing the supply chain partners up the value chain as illustrated by FMVAR1 and CONCE4. This experience was also similar to the Packaging

Manufacturers who had experienced the outcomes of job creation and stimulating business opportunities through the new circular solutions developed. The difference was the experience of the FMCG group as illustrated by FMCBV1 who experienced that the social compliance had been embedded to an extent of prioritizing human rights through responsible sourcing. This aspect was not mentioned within the Consultants group.

The Mining and Heavy industries group were similar to both FMCG and Consultants in seeking opportunities to improve social outcomes through ongoing collaboration efforts. The distinct experience illustrated by OTMIN2 was how the mining industry deals with the social issues at the end of economic activity at mine closure, where preservation of livelihood is ensured through reskilling the communities as well as previous supply chain partners, often with skills unrelated to the mine's core activities

5.6.2.3 Conclusion on Social outcomes

The FMCG group mentioned the local context being South Africa and Africa as an important factor contributing to embedding social compliance. Human rights are prioritized through responsible sourcing. The FMCG group similarly to the Mining and Heavy Industry as well as the Consultants group all illustrated experience of seeking social and economic inclusion to improve livelihoods of supply chain partners and communities that they operate in through the collaboration towards circularity. These are done through ongoing collaboration activities in the transitioning process. A similar experience of social outcomes was from the Packaging Manufacturer group who experienced the contribution of circular solutions to localisation, job creation and opening new business opportunities for entrepreneurs. The unique insight was from the experience of the Mining and Heavy industry group illustrated by OTMIN2 on how the restoration process (mine closure) facilitates social outcomes through the reskilling and training of the communities and previous supply chain partners in alternative skills to ensure continued livelihoods beyond the mine.

6. CHAPTER 6: DISCUSSION OF FINDINGS

6.1 Introduction

In this chapter a comparative analysis of the findings in Chapter 5 in relation to the literature will be discussed. Like the preceding Chapter 5, this chapter is organised by research question. Each research question and each of the selected theme(s) or sub-theme(s) are discussed and compared with the latest academic discussions of the literature reviewed in Chapter 2.

The aim of this chapter was to conduct a further process of analysis to confirm whether the findings could be confirmed or required amendment by checking the findings with extant literature. Therefore, a systematic, consistent, and replicable process was followed in the comparative analysis to ensure rigour and internal validity of the outcomes.

The process of comparison was done for each theme or subtheme. Under each theme or sub-theme that had already existed in the literature (similarities) as per the mapping exercise conducted in the analysis of the data, the findings were compared to the literature reviewed and a conclusion was made on that comparison/analysis.

In the cases where the findings reflected differences or nuances of difference to the literature reviewed (new themes or subthemes), the researcher conducted an additional three step process of analysis, to confirm if these were valid differences or if any existing literature could be found. These steps are not comprehensive but were designed to follow a systematic and consistent approach for the analysis. These steps are described below:

Step 1:

The researcher conducted a word search of the theme on three selected articles that were reviewed in Chapter 2. The words used to perform the search were declared.

Step 2:

If no literature was found in Step 1, then the researcher selected three top scholars already in the literature reviewed and then searched for additional relevant articles written by these scholars and published on the topic in the last five years. A word search of the theme on those recent articles was conducted, with the words used declared. If the word search found some literature related to the theme, the literature was analysed to unpack any similarities or differences from the research findings. If the word search did not return any literature related to the theme or sub-theme then Step 3 was performed.

Step 3:

In this step a search for the relevant construct was performed on Google Scholar utilising a Boolean search string. If this search returned some literature related to the theme, the literature was analysed to unpack any similarities or differences from the research findings. If this search yielded no results, this was considered to indicate potential differences and a potential new contribution to the literature.

Any new literature that was introduced and discussed in this chapter was included in the reference list. This was additional literature over and above that reviewed in Chapter 2.

This systematic process was to check and compare whether the findings from the analysis in Chapter 5 were already in the literature or a potential new contribution to the body of knowledge could be claimed. Each section ends with a conclusion on the research question outcomes. The chapter concludes with a revised conceptual framework.

6.2 Research Question 1: Supply Chain Collaboration

6.2.1 RQ 1: Theme 1 – Supply chain collaboration drives the transition

6.2.1.1 Evidence of how collaboration drives the transition from Findings

The FMCG and CE Consultants groups of participants had similar experience of supply chain collaboration driving the transition to a CE by driving innovation. This was done through platforms created for sharing of information such as innovation showcases. The Mining and Heavy Industry group individual participants had similar experience of how supply chain collaborating drives the transition through applying value chain considerations in sourcing. The criteria used to asses partners also included compliance with health, safety and environmental standards which therefore encouraged compliance across the value chain. There was a unique insight from the FMCG who had experienced that there was insufficient consideration of the broader value chain in the collaborations. The Packaging Manufacturer group stated that the supply chain collaborations facilitate a dialogue on sustainability issues amongst the value chain partners and this plays a role in preventing undesirable development of new products that may create end of life problems. This was shared by the Mining and Heavy Industry group who expressed those collaborations instilled a sustainability mindset internally through the joint assessment of requirements.

Similarly, the sustainability mindset was expressed by the CE Consultants group who

illustrated that organisations were going beyond just fixing the negative impacts of the linear system but proactively driving positive CE related changes. A unique experience from the CE Consultants group which was not experienced by any of the other groups was the drive towards the transition through allocation of financial resources to sustainability initiatives. The element of size was emphasised here as large corporates with large spending capacity could thus effect big scale impacts.

6.2.1.2 Evidence of how collaboration drives the transition from Literature

The increasing interest in the sustainability of supply chains resulted in an evolution of the supply chain management practices and types of supply chains culminating in the latest developments of circular supply chains. The various types of supply chains including CSC, CLSC, OLSP and reverse logistics are vital for the implementations of the CE. Insights by scholars such as Berardi and de Brito (2021) and Hussain and Malik (2020) on the important of supply chain collaboration as the route towards both technical and social innovation are important. Further, the impact of the supply chain management evolution on the types of collaborations required to facilitate the transition are key. As per Hussain and Malik's (2020) conclusions, the supply chains for a transition to a CE have a wide span in the supply chain network integrating several actors from various sectors collaborating in the recovery of waste energy and materials for use as raw materials or inputs into other processes.

Hina et al.'s (2022) research explored the external barriers to successful supply chain collaborations and they, similarly to Berardi and de Brito (2021), found that one of the external factors cited by scholars as a barrier to collaboration in the CE was the reluctance of organisations to share information. Both these studies were assessing barriers and enablers of CE implementation. Berardi and de Brito (2021) took the perspective of supply chain collaboration whilst Hina et al. (2022) were using the perspective of circular business model execution, hence their study referred to business collaboration (in the value chain networks, therefore not necessarily supply chain partners) in this case. The Hina et al.'s (2022) study considered all value chain collaborations which in the context of transitioning towards circularity could be horizontal collaboration with industry peers.

Tura et al. (2019) were in agreement with Berardi and de Brito's (2021) proclamations and suggested that in collaborating for a CE transition, standardized knowledge sharing mechanisms established a conducive atmosphere for generating ground-breaking ideas, as does the alignment of interests and the alignment of mindsets or organisation cultures.

Tura et al. (2019) utilized the lens of business collaboration as an enabler of the transition to CE. Their angle of analysis thus differed from Berardi and de Brito's (2021) whose study was specific through the lens of the supply chain collaboration facilitating the transition to CE. Although the perspectives differ, the collaboration for CE phenomenon was the common thread and this highlighted the need for better understanding of business-to-business collaboration in order to transition towards the CE which could sometimes be in the supply chain or at industry or peer level. Industry level transformation towards circular economy form part of the transition and would have an impact on that industry's supply chains, therefore the insights remain relevant. Further research into collaboration in the supply chain would address this gap in literature and assist organizations deal with challenges in transitioning to circularity.

Scholars such as Vermunt et al. (2019) and Salvioni et al. (2020) each made similar insights regarding the role of the type of the circular business model being assessed in determining the extent to which supply chain collaborations facilitated a transition. Vermunt et al. (2019) found that the behaviours and requirements for forming and managing the collaborative relationships were contingent on the CBM under review.

6.2.1.3 Comparative Analysis of Findings vs. Literature

The research finding from the Mining and Heavy Industry group illustrated how supply chain collaborating drives the transition through applying value chain considerations and sourcing criteria which encouraged health, safety and environmental compliance across the value chain confirmed the value chain impacts in literature. As per Hussain and Malik's (2020) conclusions, the supply chains for a transition to a CE have a wide span in the supply chain network integrating several actors from various sectors collaborating in the recovery of waste energy and materials for use as raw materials or inputs into other processes.

The FMCG and CE Consultants groups' experience of supply chain collaboration driving the transition to a CE by driving innovation confirms the findings in literature by Tura et al. (2019) in agreement with Berardi and de Brito's (2021) who suggested that in collaborating for a CE transition, standardized knowledge sharing mechanisms established a conducive atmosphere for generating ground-breaking ideas. The research found that this was done through platforms created for sharing of information such as innovation showcases.

Another similarity with the literature was the experience of how collaborations provide a

conducive atmosphere for knowledge sharing and dialogue as expressed by the Packaging Manufacturer which confirmed Tura et al. (2019) and Berardi and de Brito's (2021) proclamations that in collaborating for a CE transition, standardized knowledge sharing mechanisms established a conducive atmosphere for generating ground-breaking ideas. The research findings further added a unique insight that these dialogues served to prevent undesirable development of new products that may create end of life problems. Tura et al. (2019) and Berardi and de Brito's (2021) proclamations about the alignment of interests and the alignment of mindsets or organisation cultures were further confirmed by the Mining and Heavy Industry group who expressed that the collaborations instilled a sustainability mindset internally and across the value chain through the joint assessment of solutions.

The insights by Vermunt et al. (2019) and Salvioni et al. (2020) that the behaviours and requirements for forming and managing the collaborative relationships were contingent on the CBM under review were confirmed by the research findings. All the research participants groups were involve involved in implementing a combination of the 9Rs CE strategies, for which collaboration with value chain partners was a key enabler. None were involved in implementing the product-as-a service model, for which supply chain collaborations may not be so critical.

6.2.1.4 Conclusion

The research findings confirmed the literature regarding the importance of supply and value chain/network collaborations in facilitating the implementation of a CE (Hussain & Malik, 2020). The research findings also confirmed the literature regarding how collaborations provide a conducive atmosphere for knowledge sharing, alignment of interests and drives the innovation required for the transition to a CE (Tura et al., 2019; Berardi and de Brito, 2021). This therefore adds to the body of knowledge on supply chain collaborations as a facilitator of the transition to a CE.

There were no differences noted by the researcher between the literature and the research findings on supply chain collaboration as a driver of the transition to a CE.

6.2.2 RQ1 Theme 2 – Power Asymmetry

The theme of power asymmetry was an existing theme from the literature reviewed in Chapter 2 and there was a specific insight of an imbalance of power in the supply chain collaboration relationships that emerged from the research findings. This was selected for discussion due to the diversity of experiences and unique insights from the groups of

research participants. The diversity of experiences contributes to a deeper understanding of the phenomenon.

6.2.2.1 Evidence of Power Asymmetry from Findings

All four groups of participants had experienced the power asymmetry theme in their supply chain collaborations. All the research participants groups shared a similar experience that the power balance was skewed towards the lead firms and was influenced by the position and level of influence in the supply chain that each organisation had. The strong position of the lead firms created a tendency to dictate or impose solutions on the other supply chain partners. The four groups of participants had similarly experienced that a willingness to consider other partners' inputs in terms of their requirements or other ideas enhanced the success of the collaboration.

There was a unique insight from the Packaging Manufacturer group owing to its position in the supply chain being in the middle, thus dealing with its upstream suppliers as well as downstream customers who are the more dominant firms/brand owners or producers of the products to be packaged. The insight was that both the customer's and the supplier's positions, requirements and ideas were important to take into consideration to arrive at an optimal solution and this would involve iterative interactions from top down and then bottom up.

The Mining and Heavy industry group also shared an experience of the subtle power dynamic presented in how meetings were scheduled without flexibility which could be perceived as dictating to partners.

Another unique insight was from the Consultants group regarding Supplier and Enterprise Development (SED/ED) programs having better success with managing the power asymmetry dynamics of collaboration due to the incentive for the larger firm in the achievement of the targets, this revealed a unique context where the size vs. dependency dynamics are different. The SED/ED programmes are one of the pillars of the Broad-Based Black Economic Empowerment (B-BBEE) Scorecard which are part of the B-BBEE legislation in South Africa.

Lastly, the Consultants group had also experienced that corporations rarely collaborated without dictating to partners from the top. This demonstrated a power imbalance rooted in the dominant role of influence, size and position in the supply chain.

6.2.2.2 Evidence of Power Asymmetry from Literature

Brito and Miguel (2017) noted that the power balance between partners contributed to the longevity of supply chain relationships. They found that the choice of governance mechanisms i.e., relational vs. contractual was largely influenced by the power asymmetry in the buyer-supplier relationships. Brito and Miguel (2017) noted that underhandedness arose when bargaining power positions in the supply chain were unbalanced. This supported Berardi and de Brito's (2021) assertions that the position of a partner in the supply chain ought to be considered as this contributed to power asymmetry being a key theme in the effectiveness of collaborative relationships.

Franco's (2017) insights were similar to Berardi and de Brito's (2021) finding that the position in the supply chain played a role in the power dynamics of supply chain collaborations. Franco (2017) found that the company's position in the production value chain dictated how much they could influence the demand push or pull and thus the willingness of supply chain partners to collaborate in developing circular solutions. This dynamic had a lot to do with the level of dependence on the supply chain partner be it dominance by size (downstream pull) or dependence for raw materials (upstream push).

A unique insight by Franco (2017), which was not identified by neither Brito and Miguel (2017) nor Berardi and de Brito (2020) was that the size of the buyer relative to its suppliers played a role in the power dynamics, regardless of the position on the supply chain. Smaller players found it difficult to convince their larger supply chain partners to collaborate with their circular innovations due to the lack of economies of scale.

6.2.2.3 Comparative Analysis of Findings vs. Literature

The areas of similarities between the findings in Chapter 5 and the literature reviewed will be discussed first. This will be followed by the differences between the findings and the literature.

The findings from section 5.2 revealed that the position of an organisation on the supply chain had significant influence in the power dynamics leading to the lead firms dictating and imposing on the other supply chain partners due to their dominant position of influence. Berardi and de Brito's (2021) and Franco (2017) found that the position in the supply chain played a role in the power dynamics of supply chain collaborations. Franco (2017) found that the company's position in the production value chain dictated how much they could influence the demand push or pull and thus the willingness of supply chain partners to collaborate in developing circular solutions. The role of position was

confirmed by the insight from the Packaging Manufacturers who play a role in the middle of the supply chain was that both the customer's and the supplier's requirements and ideas were important to take into consideration to arrive at an optimal solution and this would involve iterative interactions from top down and then bottom up. Franco's (2017 additional insight was that size trumped position in creating bargaining power. This was not tested in this research as the sample only consisted of large organisations.

The FMCG and Mining and Heavy Industry participants who represented the lead firms acknowledged that surrendering the bargaining power facilitated stronger and long-lasting collaborations. This was similar to Brito and Miguel's (2017) assertions that a balance of power between supply chain partners contributed to the longevity of supply chain relationships.

A unique insight from the research findings was from the Consultants group regarding Supplier and Enterprise Development (SED/ED) programs having better success with managing the power asymmetry dynamics of collaboration due to the dependence of the larger firm on the achievement of the targets, this revealed a unique interplay of size vs. dependency. There was no evidence of this dynamic in the literature as it is related to the Board-Based Black Economic Empowerment (B-BBEE) legislation which was unique to South Africa. There are incentives for the lead firm to develop its suppliers and smaller enterprises within its supply chain. This incentive drives the lead firm to surrender its bargaining power which leads to a longevity of the collaboration. This therefore is a nuance of difference between the findings and the extant literature.

6.2.2.4 Conclusion

The research findings confirmed the literature regarding power asymmetry and the influence of the position of the organisation of the supply chain in dominating the collaborative relationships (Berardi & de Brito, 2021; Brito & Miguel, 2017). The role of balanced power relations in facilitating long-term collaborations (Brito & Miguel, 2017) was also confirmed by the findings as all participant groups had experienced that a willingness to consider other partners' inputs enhanced the success of the collaboration. There was a nuance of difference identified in the findings due to the unique B-BBEE legislation in the South African context. The larger corporates were incentivised to develop smaller players within their supply chain which balances the power asymmetry. This nuance of a difference will be represented as a subtheme under the power asymmetry theme and labelled "supplier development incentives". This will be shown as a potential new sub-theme in the amended framework at the end of this chapter.

6.3 Research SubQ1: Role of Partners Selection and Capabilities

The three themes with key insights that were selected for further analysis and discussion under the research question on partners selection and partner capabilities were: complementary capabilities, financial capability and the ability to pre-assess partners.

6.3.1 Research SubQ1: Theme 1 – Complementary Capabilities

6.3.1.1 Evidence of Complementary Capabilities from Findings

The importance of complementary capabilities was expressed by many participants in the FMCG and the CE Consultants groups. Within the FMCG group there were diverse experiences that were organisation centric. The variation of how the complementary capabilities were experienced was in terms of the value added by these capabilities. The FMCG group had experienced that the organisation deemed complementarity based on its own strengths or capabilities as well as the problem or challenge at hand. In some instances, complementary could be expertise, scale, position in the supply chain or the ability to free up capacity and thus improve focus and efficiency for the organization. The CE Consultants had similar experiences within the group in that each had a holistic view of project delivery – focusing on optimizing delivery by putting together partners who complemented each other's strengths. Some elements of this holistic view were similar to the FMCG group, such as where internal gaps were complemented by partners to enable delivery.

A unique experience from the FMCG group was a participant who had experienced complementary capabilities being utilized to capacitate the organisation in carrying out new tasks as a result of the extended supply chain into reverse logistics, which was different from other FMCG as well as the CE Consultants group.

The Packaging Manufacturer group's experience was also unique in that their perspective was upstream in its own inbound supply chain and not the supply chain into which they were supplying.

6.3.1.2 Evidence of Complementary Capabilities from Literature

The study by Veleva and Bodkin (2018) considered the role of entrepreneurial firms in playing a complementary role in circular supply chains. They argued that strategic partnerships between large firms and small businesses could create value and reduce costs through varied but complementary capabilities. For instance, small entrepreneurial firms had strong innovation capabilities and flexibility but were deficient in financial muscle and scale, therefore collaboration with larger corporates unlocked opportunities to implement CE initiatives.

Jager and Piscicelli (2021) proposed that organisations needed to start with an internal and external assessment of the project context and identify capability gaps, following which complementary capabilities could be sought. Their study also found that the top three partner capabilities that were valued by collaborative partners were: goal alignment, innovation, and communication capabilities.

Berardi and de Brito (2021) argued that business-to-business collaborations could enhance results of the CE implementation. Berardi and de Brito (2021) recognised that these collaborations go beyond the buyer-supplier dyad and engaged players from several value chains and stakeholders in the supply network. They proclaimed that supply chain partners could combine their individual resources and thus leverage the complementarities in a manner that enhanced the implementation of CE initiatives. Berardi and de Brito (2021) argued that physical proximity of the partners influenced the ability to create complementary assets from the collaboration.

Both Berardi and de Brito (2021) and Veleva and Bodkin's (2018) found similarities regarding the importance of finding complementary capabilities. Similar to Berardi and de Brito's (2021) strong focus on innovation as an outcome of the collaboration, Jager and Piscicelli (2021) highlighted innovation as a vital partner capability. This was similar in all three studies as innovation capability was also identified by Veleva and Bodkin (2018) that the value of selecting entrepreneurial firms to partner with was their flexibility which complemented the rigidity of larger firms.

6.3.1.3 Comparative Analysis of Findings vs. Literature

The research finding from the FMCG group that the organisation deemed complementarity based on its own strengths or capabilities as well as the problem or challenge at hand was similar to Jager and Piscicelli's (2021) assertions that the complementary capabilities required in a partner were based on an inward-looking capability gap assessment. The research found that in some instances, complementarity could be expertise, scale, position in the supply chain or the ability to free up internal capacity and thus improve the focal organisation's focus and efficiency. The research also found within the CE Consultants group, who brought a holistic view, also confirmed that companies sought to complement internal capability gaps through supply chain partners to enable the delivery of a CE. These research findings support Veleva and Bodkin's (2018) findings regarding the complementary nature of small entrepreneurial firms' strong innovation capabilities and flexibility but deficient in financial muscle and scale, to the larger corporates who had funding but lacked agility. These collaborations

ensure that each party can focus on its core strengths thus achieving superior performance.

The unique experience from the FMCG group of complementary capabilities being utilized to capacitate the organisation in carrying out new tasks as a result of the extended supply chain into reverse logistics, corroborates Berardi and de Brito's (2021) proclamation that supply chain partners could combine their individual resources and thus leverage the complementarities in a manner that enhanced the implementation of CE initiatives.

The research finding concerning the Packaging Manufacturer group's experience referring to upstream in its own inbound supply chain and not the supply chain into which they were supplying affirms Berardi and de Brito's (2021) statement that these collaborations extend beyond the buyer-supplier dyad and engaged players from several value chains and stakeholders in the supply network.

The findings on complementary capabilities therefore confirm the discussions in extant literature.

6.3.1.4 Conclusion

There were no differences noted by the researcher between the literature and the research findings on the role of complementary capabilities in supply chain collaborations for a CE. The research findings confirmed the discussions in extant literature. This therefore adds to the body of knowledge on the role of complementary capabilities as a theme in partner selection.

6.3.2 Research SubQ1: Theme 2 – Financial Capability

The financial capability is a theme related to the role of partner selection and partner capabilities in the supply chain collaboration for a circular economy transition.

6.3.2.1 Evidence of Financial Capability from Findings

The importance of financial capability in a supply chain collaboration partner was expressed by two participant groups, the CE Consultants and the FMCG groups. None of the Mining and Heavy Industry or Packaging Manufacturer groups mentioned financial capability as an important criterion in selecting a partner to collaborate with. There was similarity in the experiences of the two groups being that the financial capability was an

additional criterion over and above the ability to deliver expertise or partner networks. The difference between the two groups was that for the Consultants group emphasis was on ability to manage finances, whereas for the FMCG group the emphasis was a requirement for the partner have the ability or financial resources to make an investment into the collaboration activities, which was considered critical for the longevity of the partnership.

6.3.2.2 Evidence of Financial Capability from Literature

At this stage there was no evidence of the financial capability theme in the partner selection literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above will be followed.

Step 1

The selected articles for the word searches were articles already in the literature reviewed in Chapter 2: Veleva and Bodkin (2018), Berardi and de Brito (2021) and Jager and Piscicelli (2021)

The words used to search the articles were: “financial capability”, “financ*”, “funding”, “financial management” and “invest”.

The word searches on the three selected articles had the following results:

The Veleva and Bodkin article had matches with the words “financing” and “financial”, however the debate in this piece of literature relates to the entrepreneurial firms’ lack of access to finance which hinders their ability to accelerate the transition towards a circular economy. The inability of these small and innovative firms to implement their innovations or scale up their operations to meet demand was seen as a barrier. However, Veleva and Bodkin (2018) posit that collaboration with larger firms (who lack agility to innovate) would close this gap and leverage the complementary capabilities of the partners to accelerate the transition towards a circular economy.

The Veleva and Bodkin (2018) article had matches with the words “financing” and “financial”, the discussion on this theme in literature is therefore discussed in the next section. There were no matches with the search words in the Berardi and de Brito (2021) and Jager and Piscicelli (2021) articles.

6.3.2.3 Comparative Analysis of Findings vs. Literature

The academic debate by Veleva and Bodkin (2018) on financial capability relates to the entrepreneurial firms’ lack of access to finance which hinders their ability to accelerate the transition towards a circular economy. The inability of these small and innovative

firms to implement their innovations or scale up their operations to meet demand was seen as a barrier. However, Veleva and Bodkin (2018) posit that collaboration with larger firms (who lack agility to innovate) would close this gap and leverage the complementary capabilities of the partners to accelerate the transition towards a circular economy.

This was an area of difference with the literature in that the research findings were that the financial capability (access to funding and ability to manage finances) of a partner was a critical criteria and pre-requisite in selecting a partner, over and above expertise and networks. By contrast the literature suggests that in the case of small firms, the innovative capability and agility could be leveraged to access the funding capabilities of larger firms, thus eliminating the need for the selected partner to have financial capabilities.

6.3.2.4 Conclusion

There is a nuance of difference between the literature and the research findings. Both indicate the importance of financial capabilities, but in the findings, this was posed a pre-requisite, whereas in the literature it was posed as a driver of collaboration in the specific case of corporate-entrepreneur collaborations. This will be presented as a sub-theme to the partner selection criteria under the Complementary Capabilities in the amended conceptual framework at the end of this chapter.

6.3.3 Research SubQ1: Theme 3 - Ability to pre-assess partners

The ability to pre-assess is a theme related to the role of partner selection and partner capabilities in the supply chain collaboration for a circular economy transition.

6.3.3.1 Evidence of Ability to Pre-assess from Findings

The FMCG group expressed diverse experiences with respect to the ability to pre-assess partners which included alignment with the lead firm's vision, having a detailed questionnaire which interrogates the value chain and the potential suppliers' supply chain and inputs. Within the same group there was a participant who had a different experience in terms of ability to pre-assess a partner when the lead firm was not certain what was required with a new technology or novel solution. In such cases they had experienced that pilots were useful as a pre-assessment tool. The Packaging Manufacturer group had experienced similar to the FMCG group, the difficulty in specifying what was required for new products or solutions. In such cases undertaking market research ensured that the specifications requested were realistic and matched what the market could offer and not some utopian solution that did not exist.

The Mining and Heavy industry had diverse in-group experiences which were also unique to the group, these included the challenge of not being able to assess upfront whether the partner could deliver according to their claims. A different experience within the same group was providing each potential partner a set of requirements to measure themselves against in terms of working structure, skills and infrastructure and rate their ability to match the requirements. The CE Consultants' group was different in that they did not express experience of ability to pre-assess the partners.

6.3.3.2 Evidence of Ability to Pre-assess from Literature

At this stage there was no evidence of this theme in the literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above will be followed.

Step 1

The selected articles for the word searches were on articles already in the literature reviewed in Chapter 2: Berardi and de Brito (2021), Jager and Piscicelli (2021) and Tura et al. (2019)

The words used to search the articles were: "assess*", "pre-assess", "due diligence", "specification" and "evaluate".

The word searches on the three selected articles did not yield anything. Therefore, Step 2 was performed.

Step 2

The selected scholars for the word searches were: Phil Brown, Nancy Bocken and Jennifer Goodman.

The following articles were found:

Scholar	**Article**
Phil Brown	Brown et al., (2021)
Nancy Bocken	Bocken et al., (2022)
Jennifer Goodman	Goodman et al., (2020)

The three articles that were recently published by these scholars about the circular economy and partner selection did not yield any matches with the word searches. Therefore, Step 3 was performed.

Step 3

In this step a Boolean search string ("circular economy" and "partner selection") was used to search for articles on Google Scholar, restricted to articles published since 2018-2022. The only relevant articles returned by this search were some of those already reviewed in the first two steps above. It was therefore concluded that the theme of ability to pre-assess partners could not be found in literature.

6.3.3.4 Conclusion

Based on the search of the literature on the circular economy and partners selection, it was concluded that the theme of ability to pre-assess partners for collaboration appears to not have been discussed in the extant literature. This is seen as an area of difference with the existing literature. This insight will therefore be included as a potential new theme in the revised framework. Based on the literature searches done and the literature that was subsequently reviewed this potential new theme was re-labelled to "partner due diligence".

6.4 Research SubQ2: Mechanisms used to manage collaborative relationships

6.4.1 Research SubQ2: Theme 1 – Communication

Communication is a theme related to the mechanisms used to manage relationships in the supply chain collaboration for a circular economy transition.

6.4.1.1 Evidence of Communication from Findings

All the four participant groups emphasized that in their experience a continuous flow of information, knowledge sharing or regular communication between the supply chain partners played an important role in the success of the collaborative relationships.

The CE Consultants and Mining and Heavy Industry group had experienced the value of industry platforms that were used to communicate and share knowledge and learnings either across industries or within a specific sector as valuable in building the relationships.

There were two unique insights within the participant groups; the first being the FMCG group who had experienced the role of technology in enhancing the performance of supply chain partners and thus the outcomes of the collaboration. The second was within the CE Consultants group who expressed that the clarity of communication and honesty played a key role in the longevity of collaborative partnerships.

6.4.1.2 Evidence of Communication from Literature

At this stage there was no evidence of the theme of communication in the literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above was followed.

Step 1

The selected articles for the word searches were on articles already in the literature reviewed in Chapter 2: Tura et al. (2019), Veleva and Bodkin (2018) and Berardi and de Brito (2021)

The words used to search the articles were: “communication”, “communicate”, “knowledge sharing”, “information sharing” and “inform”.

There were some matches with the word searches on the three selected articles. Therefore, the comparative analysis of the research findings to the extant literature is discussed in the next section.

6.4.1.3 Evidence of Communication in Literature

Berardi and de Brito (2021) mentioned the fundamental feature of collaboration was the exchange of information by the supply chain partners such with a view to solving shared problems. A successful collaborative relationship should therefore facilitate communication such that knowledge bases were combined. Berardi and de Brito (2021) asserted that the longevity of the relationships relies on this knowledge exchange.

A similar conclusion was made by Tura et al. (2019) who found that mechanisms facilitating open communication were key drivers of supply chain collaboration for the transition. Information technology was said to be a key enabler of information sharing platforms for multiple stakeholders. This enabled information transparency which influences the adoption of the collaborative CE models. By contrast lack of communication was a barrier to collaboration (Tura et al., 2019).

A different discussion of the theme was found in Veleva and Bodkin (2018) who proffered that communication was important for the transition to a CE, however not in the context of business-to-business collaboration. Veleva and Bodkin (2018) discussed business to consumer communication. Their argument was that communicating the environmental and social benefits of the CE would raise awareness and increase demand for circular products. This was however not related to communication between the supply chain partners in a collaborative relationship.

6.4.1.3 Comparative Analysis of Findings vs. Literature

The research finding that continuous flow of information, knowledge sharing or regular communication between the supply chain partners played an important role in the success of the collaborative relationships concurs with conclusions made in extant literature by Berardi and de Brito (2021) and Tura et al. (2019). The findings further coincide with Tura et al. (2019) who found that information sharing platforms for multiple stakeholders was a key driver of supply chain collaboration for the transition. Berardi and de Brito's (2021) assertion that the longevity of the relationships relies on this knowledge exchange, was confirmed by the CE Consultants group experience.

Similarly, the research findings were that information technology as well as industry platforms that were used to communicate and share knowledge and learnings either across industries or within a specific sector as valuable in building the collaborative relationships. Whilst the literature emphasised information technology improving transparency and trust, the research findings emphasised the role of information technology in enhancing the performance of supply chain partners and thus the outcomes of the collaboration.

Veleva and Bodkin's (2018) proclamation that communicating the environmental and social benefits of the CE would raise awareness and increase demand for circular products did not emerge on the research findings under the mechanisms for managing relationships.

6.4.1.4 Conclusion

There were no differences noted by the researcher between the literature and the research findings. The research findings confirmed the role of communication in cementing the collaborative relationships and facilitating the transition. This adds to the body of knowledge on the role of communication.

6.4.2 Research SubQ2: Theme 2 – Willingness to Capacitate

A willingness to capacitate supply chain collaboration partners was a theme emerging from this research under the mechanism used to manage the collaborative relationships to transition towards a CE.

6.4.2.1 Evidence of Willingness to Capacitate from Findings

The key insights emerging on this theme of willingness to capacitate supply chain

partners was that the lead or focal firm experienced transitioning to a circular economy as a new field and therefore finding a fully capable partner was unlikely. The FMCG group expressed mutual learning where partners must be willing to assist each other and learn together whereas the Mining and Heavy Industry group emphasised the lead firm capacitating its suppliers. The FMCG and Consultants groups recognised the value of building awareness and capacity across the value chain and therefore saw this training and capacitation as an investment in the transition.

There was also recognition of the local South African context for social inclusiveness laws like Broad-Based Black Economic Empowerment (B-BBEE). In instances where the empowerment partners were not at the required level of sustainability performance, the experience of participants was to assist them to reach the required level.

Further, capacitating suppliers with technology or tools for customer relationship management, carbon management and measurement as well as lean manufacturing was experienced to drive efficiencies and assist each partner to achieve their deliverables.

The Mining and Heavy Industry group shared an experience that a willingness to train existing partners eliminates the need to switch after a relationship is established. It is more beneficial to maintain the same partners and capacitate the to deliver. This demonstrates the entrenchment of a partnership relationship in supply chain collaborations for a circular economy.

6.4.2.2 Evidence of Willingness to Capacitate from Literature

At this stage there was no evidence of this theme in the literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above was followed.

Step 1

The selected articles for the word searches were on articles already in the literature reviewed in Chapter 2: Hina et al. (2022), Veleva and Bodkin (2018) and Shekarian et al. (2019). The words used to search the articles were: “train”, “capacity”, “upskill”, “teach” and “share”. The word searches on the Shekarian (2020) did not yield any matches. There were some matches of words on the other two articles however the discussions were not relevant to willingness to capacitate supply chain partners in a supply chain collaboration relationship. Bothe Hina et al. (2022) and Veleva and Bodkin

(2018) referred to requirements for training of employees on the concept of CE or CEBM. Both the articles also made recommendations for capacity building, through the development of training programs in higher education because a lack of training was seen as a barrier to the transition to a CE.

The searches on the selected articles therefore did not yield relevant literature related to the theme of willingness to capacitate supply chain partners in collaborating for a circular economy. Therefore, Step 2 was performed.

Step 2

The selected scholars for the word searches were: Vesela Veleva, Maryam Hina, and Ehsan Shekarian. These were three top scholars already in the literature reviewed and additional relevant articles written by these scholars and published on the topic in the last five years were sought.

The following articles were found:

Scholar	**Article**
Vesela Veleva	No recent relevant articles found
Maryan Hina	No recent relevant articles found
Ehsan Shekarian	Avati et al. (2022)

The article found that was recently published by Ayati et al. (2022) about the circular economy had a match on “skills”, however on close inspection the topic was about lack of skills as a barrier to the transition and not related to capacitation of supply chain partners as a mechanism of managing the collaborative relationships. Therefore, Step 3 was performed.

Step 3

In this step a Boolean search string (“circular economy” and “skills” and “capacity”) was used to search for articles on Google Scholar, restricted to articles published since 2018-2022.

The search returned the following articles which were considered relevant:

	Article
Article 1	Buch et al. (2021)
Article 2	Schroeder et al. (2019)

Article 1 was considered even though it was published in an open-source journal. The

word search in this article returned a match. However, the topic discussed was capacity building in terms of training and upskilling waste pickers to empower them to increase the profitability of their endeavours and enhance their livelihoods. This was not in the context of managing supply chain relationships within a collaboration for a circular economy.

Article 2 was also considered despite the *Journal of Industrial Ecology* being rated 2 on the AJG. This article identified SDG4 (quality education) as a lever for building the skills capacity required to enlarge the scale of adopting CE practices. Again, this was not in the context of managing the relationships.
It was therefore concluded that the theme of willingness to capacitate supply chain partners could not be found in literature.

6.4.2.4 Conclusion

Based on the search for the literature on the circular economy and capacity building, it is concluded that the theme of willingness to capacitate supply chain partners to manage collaborative relationships appears to not have been discussed in the extant literature. This was seen as an area of difference with the existing literature. This insight will therefore be included as a potential new theme in the revised framework. Based on further reading of the related literature, the subtheme will be re-labelled to “partner support”.

6.5 Research SubQ3: Barriers and Enablers of the Transition to a CE

6.5.1 Research SubQ3: Barriers Sub-Theme 1 – Lack of coordination

The lack of coordination was a theme emerging under barriers towards transitioning to a circular economy.

6.5.1.1 Evidence of Lack of coordination from Findings

The CE Consultants and the FMCG groups experienced that certain businesses had hidden agendas to protect their legacy investments and were thus circumventing sustainability. The Packaging Manufacturers participant group’s key insight was that the efforts of supply chain role-players were not coordinated, particularly regarding the end of life of products. The Packaging Manufacturers group stated that the waste management system in South Africa was inadequate in keeping plastics inside the loop and out of the environment. This made redesigning of packaging to biodegradable or recyclable redundant as waste would still end up in the landfill which undermined the

purpose of circularity. Another instance of uncoordinated efforts given was various industry organisations were running similar initiatives for the same sector but not talking to each other.

A unique perspective from the Consultants' group was that the changes on a global scale ultimately affected local supply chains. The international change had an impact on big local brands who are globally linked because they supply into those supply chains and must therefore comply. The strict changes in Europe, for example, had far-reaching effects into the local supply chains thus affecting even local SMEs who supply to big brands. Currently there was no central party coordinating the transition on a global, country or sector level.

6.5.1.2 Evidence of Lack of coordination from Literature

At this stage there was no evidence of the lack of coordination theme in the literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above was followed.

Step 1

The selected articles for the word searches were on articles already in the literature reviewed in Chapter 2: Hina et al. (2022), Kircherrer et al. (2018) and Berardi and de Brito (2021). The words used to search the articles were: "coordinate", "cooperate", "collaborate", and "synchronise".

The word searches on the selected articles yielded some matches on the Berardi and de Brito (2021) article and the literature is thus discussed below. Berardi and de Brito (2021) found that the coordination was key for implementation of the reverse logistics in circular business models given the geographically dispersed supply chains. They identified that the collaborating and coordinating relationships amongst supply chain partners was one of the obstacles to transitioning and that required further research. Berardi and de Brito (2021) found that in a collaborative relationship, governance mechanisms were required to control and coordinate the actions of the players. The scholars asserted that contracts were insufficient and that relational elements were also important as a mechanism. Further, it was concluded that collaborative capabilities within organisations was a prerequisite in enabling an entity to coordinate activities beyond the firm's boundary made it the responsibility of larger organisations to drive the transition.

There were no matches on the searches in the other selected articles, therefore the

comparative analysis of findings vs. literature was based on the above.

6.5.1.3 Comparative Analysis of Findings vs. Literature

The Packaging Manufacturers participant group's key insight regarding the requirement for supply chain role-players to coordinate activities regarding the end of life of products was similar to Berardi and de Brito (2021) conclusion that the collaborating and coordinating relationships amongst supply chain partners was one of the obstacles to transitioning. Berardi and de Brito (2021) specifically mentioned this was key for implementation of the reverse logistics in circular business models given the geographically dispersed supply chains. The Packaging Manufacturers participant group's insight was that the waste management system in South Africa was inadequate in keeping plastics inside the loop and out of the environment. This made redesigning of packaging to biodegradable or recyclable redundant as waste would still end up in the landfill, which undermines the transition to a CE.

The research finding that the lack of coordination in timing the legislation negatively impacts the supply chain partners that are globally linked (and those suppliers' local supply chains) did not seem to be covered in the literature that was reviewed. The research findings that in some industries there were hidden agendas to protect legacy investments and thus derailing a coordinated transition could not be found in the literature. Lastly, the research finding that there were various industry bodies running similar initiatives for the same sector but not coordinating their efforts or activities also did not appear to be in the literature.

6.5.1.4 Conclusion

There was a similarity in the research finding that there was lack of coordination between supply chain role players which derailed the implementation of end of life solutions for the CE. This was considered to be an addition to the body of knowledge on this sub-theme.

There was a nuance of difference in the research findings regarding lack of supply chain coordination in global CE legislation, timing of transitioning in different countries, defiant industry players with vested interests in protecting legacy unstainable businesses as well as industry bodies whose efforts were not coordinated. These differences do not appear to be in the literature that was reviewed. This will therefore be shown as a potential new sub-theme and based on further engagement with the literature, this will be relabelled to "lack of institutional coordination" in the amended framework at the end of this chapter.

6.5.2 Research SubQ3: Barriers Sub-Theme 2 – Cost

The cost involved in transitioning to circularity was cited as a barrier to the transition.

6.5.2.1 Evidence of Cost from Findings

The inherent additional costs associated with sustainability initiatives was expressed as a barrier to the transition to circularity. This was expressed by the FMCG and the CE Consultants groups, who stated that some departments such as finance or procurement were incentivised to reduce costs and were averse to sustainable options as they assumed cost would be higher. This cost barrier was driven internally. The experience of the CE Consultants regarding the inherent additional costs was related to further financial requirements for upskilling staff which then restricted sustainability improvements for the value chain.

Both the FMCG and Packaging Manufacturer groups had experienced the low economies of scale as a driver of increased costs. A nuance of difference related to scale economies was that the FMCG group's experience was that suppliers (of both product raw materials and packaging) exploit the first movers who have niche requirements compared to their peers through the price increases. Collaboration by packaging suppliers with mills that supply packaging components was experienced to increase the scale economies and improve affordability of sustainable packaging options.

A unique insight was mentioned by the Packaging Manufacturer group was that cost as a barrier was experienced through how waste pickers were motivated by the return on their efforts rather than the intended circular outcomes. Therefore, some types of waste would be left behind in the environment due to its low value (compared to the opportunity cost of picking).

There was a contrasting experience of the costs as a barrier from the CE Consultants group who had experienced that organisations continued to have linear thinking and operating and did not take into account the hidden costs of that. An example made was that if organisations incorporated the cost of lost raw material, energy inputs, labour and utilities into the cost of waste disposal, the hidden costs would justify a business case for transition to circular business models.

6.5.2.2 Evidence of Cost from Literature

At this stage there was no evidence of this theme in the literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above was followed.

Step 1

The selected articles for the word searches were on articles already in the literature reviewed in Chapter 2: Berardi and de Brito (2021), Hina et al. (2022) and Kircherrer et al. (2018). The words used to search the articles were: “cost”, “financial”, “barrier”, “funding” and “incentive”.

The word searches on the three selected articles yielded some matches. This evidence from the literature is discussed below.

Hina et al. (2022) identified financial risk as a barrier in circular business models due to the complexities of remanufacturing and refurbishing. Their study identified that the transition to a circular economy involved a significant investment for an organisation, not only in product redesign but also in the training of employees in the production and selling of circular products. The key contributors to the increased cost were the cost of return logistics, propelled by geographically dispersed supply chains. Hina et al. (2022) also found that remanufacturing processes were more labour intensive whereas the raw material savings were insufficient to set this off. Further, organisations were reluctant to invest in circular projects due to the uncertainty of demand which was difficult to foresee. Hina et al. (2022) also found that austerity measures were an internal barrier, to which they recommended market analysis and proper planning and budgeting to resolve financial constraints.

Kirchherr et al. (2018), similarly to Hina et al. (2022) found the high investment cost was a factor, however with a nuance of difference concluded that the sentiment of high upfront investment costs required for CE was a symptom of a wide-spread organisation culture that was resistant to the transition and thus rationalised this hesitancy as a cost issue. This was due to the frequency of mention of the cultural barrier presenting as more significant than the financial barrier in their study. The reluctance of organisations to transition was a similar finding to Hina et al. (2022). This was supported by the limited funding availability for the implementation of circular business models. Further, Kirchherr et al.’s (2018) study identified a unique insight that virgin material cost less than recycled inputs which hindered the use of recycled materials.

Berardi and de Brito (2021) had similar findings to Hina et al. (2022) that the impact of geographically fragmented supply chains added to the logistical costs of reverse logistics. By contrast to both Hina et al. (2022) and Kirchherr et al. (2018), Berardi and de Brito (2021) asserted that circular strategies (such as reduce, reuse, recycle or any of the 3Rs or 6Rs) aimed at sustainability in the supply chain promoted resource efficiency and thus reduced the cost of production.

6.5.2.3 Comparative Analysis of Findings vs. Literature

The research finding that the inherent additional costs associated with sustainability initiatives was a barrier to the transition to circularity was similar to what was found in the extant literature by Hina et al. (2022) as well as Berardi and de Brito (2021). The contrasting finding in literature by Kirchherr at al. (2018) was that the high upfront cost mentioned by organisations could be a rationalisation of their reluctance to transition towards a CE. Kirchherr et al. (2018) agreed that the cost was a factor, however not a major barrier relative to the organisation culture and attitude. The experience of the CE Consultants regarding the inherent additional financial requirements for upskilling staff confirms the finding by Hina et al. (2022) that the significant investment required for transition was not only in product redesign but also in the training of employees in the production and selling of circular products.

The FMCG and the CE Consultants groups' experience that some departments such as finance or procurement were incentivised to reduce costs and were averse to sustainable options was concurred in literature by Hina et al. (2022) who also found that austerity measures were an internal barrier.

The unique insight mentioned by the Packaging Manufacturer group that cost as a barrier manifest through how waste pickers were motivated by the return on their efforts rather than the intended circular outcomes is similar to Kirchherr et al.'s (2018) unique insight that virgin material cost less than recycled inputs which hindered the use of recycled materials. The research found that other types of waste would be left behind thus undermining the sustainability efforts. Kirchherr et al. (2018) emphasised the impact of the uptake of recycled materials on a cost comparison basis.

The CE Consultants experience was that if organisations incorporated the cost of waste disposal had the hidden costs of labour utilities and energy inputs such that if these were explicit, the hidden costs would justify a business case for transition to circular business models. This contradicted Hina et al.'s (2022) assertions that remanufacturing processes were more labour intensive whereas the raw material savings were insufficient to set this

off.

The experience of the FMCG and Packaging Manufacturer groups of small production runs driving increased costs was a nuance of difference with the extant literature. A further nuance of difference was that in the FMCG group's perceived the higher prices charged as an exploitation (by the upstream suppliers) of the first movers who have niche requirements. There was no evidence in the literature reviewed on the impact of niche productions as a driver of increased costs in the supply chain.

6.5.2.4 Conclusion

There were no distinct differences noted by the researcher between the literature and the research findings on cost as a barrier to the transition to a CE. The research findings confirmed what was in the literature regarding the significant additional costs required to implement a CE. This adds to the body of knowledge on costs as a barrier to the transition to a CE.

The nuance of a difference the research found that the niche nature of circular products and small production runs were a driver of price increases and thus contributed to the cost of transitioning. This appears to not have been discussed in the literature. The researcher will treat this as a potential refinement of existing literature, and this will be reflected as a subtheme of the barriers theme. Based on the further engagement with the literature, this will be labelled as "economies of scale".

6.5.3 Research SubQ3: Enablers sub-theme 1 – Organisation Mindset

6.5.3.1 Evidence of Organisation Mindset from Findings

There was a unique insight mentioned in the FMCG group who had experienced that organisation culture and mindset was a journey built over years which was also important to formalise and integrate into the company's way of doing things, from leveraging the brands, examining the product inputs, ensuring its packaging and all inputs into the value chain were sustainably sourced. The Mining and Heavy Industry as well as the CE Consultants group had experienced that the supply chain partners, and their sustainability performance must all be aligned to the vision of the focal firm of achieving circularity. The CE Consultants group further added that having a long-term impact in the mindset of the organisation ensures that the full impact on the environment and society is considered with all the organisation's activities.

The importance of the organisation's leadership structures setting the tone on sustainability culture was expressed as an enabler by participants in the FMCG as well

as the Heavy Industry and Mining groups. The Mining and Heavy Industry group further added a unique insight that a sustainability culture was entrenched when the responsibility moves beyond one department taking the lead to everyone doing their part. The groups expressing this experience were the focal or lead firms who drive the collaborations within their supply chains.

6.5.3.2 Evidence of Organisation Mindset from Literature

The organisational mindset shift was proclaimed to be a vital first step to enable a company to transition towards a CE (Batista et al., 2018; Hussain & Malik, 2020; Korhonen et al., 2018). The fundamentally different nature of a CE compared to other sustainability frameworks demanded changes at the core of an organisation's culture to switch and thus create a willingness to redesign the business model and make the necessary investments to implement CE strategies.

Hussain and Malik (2020) concluded that a convincing organisational rhetoric was a key enabler of the transition towards a CE and affected both the supply chain collaborations towards a CE and the desired CE objective of better environmental performance. This was supported by Tura et al.'s (2019) observations that the staff members' awareness about sustainability and a greater understanding of the economic benefits of a CE promoted a transition to CSCs. The company vision and strategy rhetoric cement the understanding and awareness amongst its employees. Understanding the economic benefits enables the justification of the business case to overcome the barriers of high initial investment costs that may be required.

6.5.3.3 Comparative Analysis of Findings vs. Literature

The experience of the FMCG group that organisation culture and mindset was a journey built over years which was also important to formalise and integrate into the company's way of doing things, confirmed what Batista et al. (2018), Hussain and Malik (2020) and Korhonen et al. (2018) found that the organisational mindset shift was a vital first step to enable a company to transition towards a CE.

Another similarity between the research findings and the literature was the importance of the organisation's leadership structures setting the tone on sustainability culture as an enabler by participants in the FMCG as well as the Heavy Industry and Mining groups. This confirms both Hussain and Malik (2020) and Tura et al.'s (2019) observations that the staff members' awareness about sustainability and a greater understanding of the economic benefits of a CE promoted a transition to circularity. The Mining and Heavy

Industry group's unique insight that a sustainability culture was entrenched when the responsibility moves beyond one department taking the lead supports Tura et al.'s (2019) assertion that the company vision and strategy rhetoric cement the understanding and awareness amongst its employees.

6.5.3.4 Conclusion

There were no differences noted by the researcher between the literature and the research findings on organisation culture and mindset as an enabler to the transition to a CE. The research findings confirmed what was in the literature regarding the importance of a strong sustainably culture and strategy in enabling the implementation of a CE. This is particularly important for the focal firms who then facilitate this through their supply chain collaborations. This adds to the body of knowledge on organisation culture and mindset an enabler to the transition to a CE.

6.5.4 Research SubQ3: Enablers sub-theme 2 – Global Frameworks

6.5.4.1 Evidence of Global Frameworks from Findings

The use of global frameworks was experienced to provide guidelines and enable the implementation of sustainability initiatives for organisations. Experience of this was shared by the FMCG group as well as the CE Consultants group. The FMCG group shared experience of the UN Global Compact framework enabling their organisations through providing access to best practice and providing the language to communicate sustainability in a manner that business could be more receptive. Within the FMCG group there was experience of how the frameworks provide structure, guidelines and enable progress on targets to be monitored and verifiable.

The CE Consultants group shared experience of how the frameworks were used as a pre-assessment tool for the organisations to identify areas of priority as well as the relevant reporting standards as determined by stakeholders and the organisation's leadership.

The global frameworks were typically the first step on the journey towards circularity and either provided guidelines and structure in target setting or in identifying the areas of priority for the organisation. The groups expressing this experience had the perspective of the lead firms in the supply chain collaborations.

6.5.4.2 Evidence of Global Frameworks from Literature

At this stage there was no evidence of this theme in the literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above was followed.

Step 1

The selected articles for the word searches were on articles already in the literature reviewed in Chapter 2: Batista et al. (2018), Hussain and Malik (2020) and Tura et al. (2019)

The words used to search the articles were: “framework”, “best practice”, “guidelines” and “structure”.

The word searches on the three selected articles did not yield anything. Therefore, Step 2 was performed.

Step 2

The selected scholars for the word searches were: Luciano Batista, Matloub Hussain and Nina Tura.

The following articles were found:

Scholar	**Article**
Luciano Batista	No recent relevant articles found
Matloub Hussain	No recent relevant articles found
Nina Tura	No recent relevant articles found

No relevant recently published articles on the circular economy and enablers by these scholars were found. Therefore, Step 3 was performed.

Step 3

In this step a Boolean search string (“circular economy” and “organisational enablers”) was used to search for articles on Google Scholar, restricted to articles published since 2018-2022. The only relevant articles returned by this search were some of those already reviewed in the first two steps above. It was therefore concluded that the sub-theme of Global Frameworks as an enabler of the transition to a circular economy could not be found in literature.

6.5.4.4 Conclusion

Based on the search of the literature on the circular economy and organisational

enablers, it was concluded that the sub-theme of Global frameworks as an enabler for organisations to transition towards a circular economy appears to not have been discussed in the extant literature. This is seen as an area of difference with the existing literature. This Global Frameworks was therefore included as a potential new sub-theme under enablers in the revised framework.

6.5.5 Research SubQ3: Enablers sub-theme 3 – Advocacy

6.5.5.1 Evidence of Advocacy from Findings

All four groups expressed having experienced advocacy as an enabler of the transition towards a circular economy. The similarity in all the four groups' experiences was the growing awareness in individuals and the important role of individuals in driving the transition to circularity. Individuals could influence as consumers through advocacy as consumers and putting pressure on brand owners and retailers as well as influence change through advocating within the organisations they worked in. This was largely driven by direct experiences of recent adverse weather events that had made individuals think and talk about the root causes of climate change. There was an insight from the Packaging Manufacturer group stating that public education would empower consumers to drive the transition as well as bring awareness about recyclability and how to dispose packaging responsibly.

A different and unique insight was illustrated by the CE Consultants group regarding the influence of the UN Young SDG Innovators Program which allowed rethinking about sustainability in businesses, which generated advocacy and could be an enabler given the prerequisite that the business had a pro-sustainability culture to start with for this program to have an impact.

6.5.5.2 Evidence of Advocacy from Literature

At this stage there was no evidence of this theme in the literature that was reviewed in Chapter 2. Therefore, the three-step process described in Section 6.1 above was followed.

Step 1

The selected articles for the word searches were on articles already in the literature reviewed in Chapter 2: Batista et al. (2018), Hussain and Malik (2020) and Korhonen et al. (2018). The words used to search the articles were: "advocacy", "consumer awareness", "educat*", "influence" and "behaviour".

The word searches on the three selected articles did not yield anything. Therefore, Step 2 was performed.

Step 2

The selected scholars for the word searches were: Luciano Batista, Matloub Hussain and Nina Tura. The results of the article search were as follows:

Scholar	**Article**
Luciano Batista	No recent relevant articles found
Matloub Hussain	No recent relevant articles found
Jouni Korhonen	No recent relevant articles found

No recently published relevant articles by these scholars about the circular economy and consumer awareness or advocacy were found. Therefore, Step 3 was performed.

Step 3

In this step a Boolean search string ("circular economy" and "consumer advocacy") was used to search for articles on Google Scholar, restricted to articles published since 2018-2022. There were no relevant articles found on this search string. It was therefore concluded that the sub-theme of consumer advocacy as an enabler of the transition to a circular economy could not be found in literature.

6.5.5.4 Conclusion

Based on the search of the literature on the circular economy and organisational enablers, it was concluded that the sub-theme of advocacy as an enabler for organisations to transition towards a circular economy appears to not have been discussed in the extant literature. This was seen as an area of difference with the existing literature. This insight will therefore be included as a potential new sub-theme under enablers in the revised framework. Note, the sub-theme "advocacy" was relabelled to "consumer advocacy" following the additional literature searches which indicated this as a more specific term.

6.6 Research: Contribution to Sustainable Development Outcomes

6.6.1 Research Theme 1 – Social Outcomes

The social outcomes emerged as a theme under sustainable development outcomes achieved from the transition towards a CE.

6.6.1.1 Evidence of Social Outcomes from Findings

The FMCG group mentioned their local context of operating in South Africa and/or Africa as an important factor that contributed to embedding social compliance. Human rights were prioritized through responsible sourcing. The FMCG group similarly to the Mining and Heavy Industry as well as the CE Consultants group all illustrated experience of seeking social and economic inclusion to improve livelihoods of the supply chain partners and the communities that they operated in through the collaborations for circularity. These were done through ongoing collaboration activities in the transitioning process. A similar experience of realising social outcomes was from the Packaging and Manufacturer group who experienced the contribution of circular solutions to localisation, job creation and opening new business opportunities for entrepreneurs.

The unique insight was from the experience of the Mining and Heavy industry group who shared how the restoration process (for a mine closure) facilitated social outcomes through the reskilling and training of the communities and previous supply chain partners in alternative skills to ensure their continued livelihoods beyond the mine's existence.

6.6.1.2 Evidence of Social Outcomes from Literature

A move from traditional supply chains to Green supply chains (GSC), Sustainable supply chains (SSC) and circular supply chains (CSCs) enabled organisations to enhance their sustainability performance (Genovese et al., 2017; Hussain & Malik, 2020; Sudusinghe & Seuring, 2022; Veleva & Bodkin, 2018). Genovese et al. (2017) further emphasised that the circular economy reaches beyond lessening the negative impacts on the environment to the design of sustainable production systems in which resources and energy circulate in the system indefinitely. This was supported by Hussain and Malik (2020) who argued that although the CE intersected with sustainable supply chain management (SSCM), SSCM had incremental impact on sustainability whereas a transition from linear to circular supply chains required revolutionary changes to the business model that were aimed at achieving sustainability outcomes.

Both Sudusinghe and Seuring (2022) and Veleva and Bodkin (2018) found that in terms of sustainability outcomes, the attention of CE studies and CSCs was on environmental preservation and economic performance with very little attention to the social aspects. Veleva and Bodkin (2018) argued that, through supply chain collaborations between large firms and entrepreneurial firms, the CE could facilitate social outcomes like creating employment, education and training opportunities, unlocking access for previously disadvantaged communities, and promoting social equity. Sudusinghe and Seuring

(2022) concurred the role of smaller firms in the supply chain, stating that the motivation to address social issues in circular operations was promoted by parties external to the focal firms.

6.6.1.3 Comparative Analysis of Findings vs. Literature

The research findings from the FMCG, Mining and Heavy Industry as well as the CE Consultants group stating that the supply chain collaboration endeavours sought social and economic inclusion to improve livelihoods of the supply chain partners and the communities that they operated in confirmed Veleva and Bodkin's (2018) argument that, through supply chain collaborations between large firms and entrepreneurial firms, the CE could facilitate social outcomes like creating employment, education and training opportunities, unlocking access for previously disadvantaged communities, and promoting social equity. This was further confirmed by a similar experience from the Packaging and Manufacturer group who experienced the contribution of circular solutions to localisation, job creation and opening new business opportunities for entrepreneurs.

There was a difference between the research findings and literature regarding the level of attention paid to the social outcomes pillar compered to environmental and economic outcomes. Both Sudusinghe and Seuring (2022) and Veleva and Bodkin (2018) found that in terms of sustainability outcomes, the attention of CE studies and CSCs was on environmental preservation and economic performance with very little attention to the social aspects. However, the research found that in the local context of operating in South Africa and/or Africa, embedding social compliance was a major focus. This extended to ensuring responsible sourcing throughout the value chain to protect human rights. The three groups, FMCG, Mining and Heavy Industry as well as the CE Consultants all illustrated that they social and economic inclusion to improve livelihoods of the supply chain partners and the communities that they operated in. Social legislation in South Africa drives the focus of businesses to improving livelihoods and addressing the prevailing inequalities. Similarly, in the rest of Africa social imperatives tend to take a higher priority to environmental issues.

A unique insight was from the Mining and Heavy industry group who shared how the restoration process (for a mine closure) facilitated social outcomes through the reskilling and training of the communities and previous supply chain partners in alternative skills to ensure their continued livelihoods beyond the mine's existence. There was no similar evidence of this in the extant literature reviewed. In the example given, the circularity

was restoration of the environment at the end of the economic activity. The priority was therefore ensuring that supply chain partners who had participated in the economic activity could maintain their livelihoods and that the community continued to thrive. This experience was unique in that the collaboration was not purely to advance the core economic activity of the mine.

6.6.1.4 Conclusion

The research findings confirmed the role of supply chain collaboration for a CE in contributing to sustainable development outcomes, particularly social outcomes. The research found that this was done through responsible sourcing, creating employment, education and training opportunities, unlocking access for previously disadvantaged communities, and promoting social equity. Partnerships with small firms and creating entrepreneurs was also mentioned and concurred findings by both Sudusinghe and Seuring (2022) and Veleva and Bodkin (2018). This adds to the body of knowledge on the role of the CE transition in contributing to sustainable development through social outcomes.

There were also some differences noted such as the high focus on social outcomes in the context of South Africa and Africa compared to findings in the literature. The research found that in the local context of operating in South Africa and/or Africa, embedding social compliance was a major focus. This extended to ensuring responsible sourcing throughout the value chain to protect human rights. This appeared to contrast Sudusinghe and Seuring's (2022) and Veleva and Bodkin's (2018) findings that the attention of CE studies and CSCs was on environmental preservation and economic performance with very little attention to the social aspects. The researcher will treat this nuance on country context as a potential refinement of existing literature, and this will be reflected as a subtheme of the sustainable development social outcomes.

Another nuance of difference was the unique and sector-specific insight from the Mining and Heavy industry group who shared how the restoration process (for a mine closure) facilitated social outcomes through the reskilling and training of the communities and previous supply chain partners in alternative skills to ensure their continued livelihoods beyond the mine's existence. This experience was unique in that the collaboration was not purely to advance the core economic activity of the mine. The researcher will treat this nuance on sector context as a potential refinement of existing literature, and this will be reflected as a subtheme of the sustainable development social outcomes.

6.7 Chapter Conclusion

In concluding this chapter, the changes made as a result of the comparative analysis of the research findings with the literature and the research outcomes are summarised.

6.7.1 Revisions Resulting from the Comparative Analysis in Chapter 6

Table 19: Summary of revisions resulting from the comparative analysis in Chapter 6

Research Question/ Construct	Beginning of Chapter 6	Comparative Analysis	Outcome	Existing OR New Theme OR New Subtheme
Supply chain collaboration	Supply chain collaboration (theme)	Similarity to the literature	Existing theme retained	Supply chain collaboration
	Power Asymmetry (theme)	Nuance of difference identified	Potential new sub-theme, labelled "Supplier development incentives"	Supplier development incentives
Partner selection and capabilities	Financial capability (theme)	Nuance of difference identified	Potential new sub-theme under Complementary capabilities instead of theme	Financial capability
	Ability to pre-assess (theme)	Distinct difference identified	Potential new theme, relabelled "Supplier due diligence"	Supplier due diligence
Relationship management mechanisms	Communication (theme)	Similarity to the literature	Existing theme retained	Communication
	Willingness to capacitate (theme)	Distinct difference identified	Potential new theme, relabelled "Supplier support"	Supplier support
Barriers and Enablers	Lack of coordination (subtheme) in barriers	Nuance of difference identified	Potential new sub-theme relabelled "Lack of institutional coordination"	Lack of institutional coordination
	Cost (subtheme) in barriers	Nuance of difference identified	Potential new sub-theme relabelled "Economies of scale",	Economies of scale
	Organisation culture and mindset (subtheme) in enablers	Similarity to the literature	Existing theme retained	Organisation culture and mindset
	Global frameworks (subtheme) in enablers	Nuance of difference identified	Potential new sub-theme,	Global frameworks
	Advocacy (subtheme) in enablers	Nuance of difference identified	Potential new sub-theme relabelled "Consumer advocacy"	Consumer Advocacy
Sustainable development outcomes	Social outcomes	Nuance of difference identified	Potential new sub-theme labelled "Country or sector context"	Country or sector context

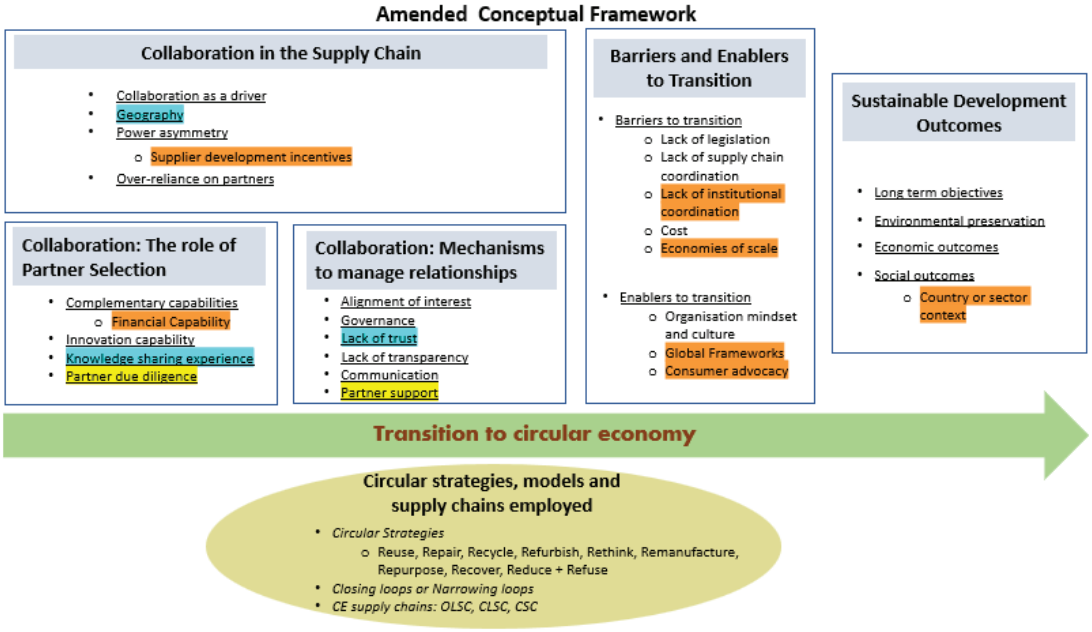
The relabelled themes and subthemes will be presented as such in the amended conceptual framework.

6.7.2 Amended Conceptual Framework

The conclusions from the comparative analysis between the research findings and the literature reviewed are presented in the amended conceptual framework in Figure 6. The research had the following outcomes:

Firstly, four themes were identified as similar to the literature and therefore these remained in the conceptual framework without any highlights. Two potential new themes were identified and are highlighted a yellow in Figure 6. Lastly, there were seven potential new sub-themes that were identified and these were highlighted in orange in Figure 6.

Figure 6: Amended Conceptual Framework



7. CHAPTER 7: CONCLUSION

7.1 Introduction

The aim of this chapter is to present the research outcomes derived from the comparative analysis of the research findings and the literature as discussed in Chapter 6. The research set out to explore the role of supply chain collaboration on the transition towards a circular economy. The setting was organisations operating in South Africa some of which also have multinational operations which included parts of Africa. The setting included four groups of participants such as the FMCG, Packaging Manufacturers, Mining and Heavy Industry as well as Circular Economy Consultants, all of whom were decision makers and involved in collaborations for a circular economy.

This chapter presents the research conclusions on each of the research questions that the study aimed to answer. Part of the research aims was to develop a conceptual framework for the supply chain collaboration for a transition towards a circular economy, this is presented in section 7.2 below. The conceptual framework illustrates the process of forming and managing the supply chain collaborations for a circular economy transition as well as the sustainable development outcomes.

The chapter is organised by research question. The theoretical conclusions for each research question are discussed by presenting the key research findings with a critical comparison to the extant literature to identify additions to literature as well as any potential extensions or potential refinements to the original conceptual framework developed from the literature reviewed in Chapter 2. The research contributions are then highlighted, together with suggestions for management and other stakeholders. Thereafter, the limitations of the study as a whole are discussed, and the chapter ends with suggestions for future research.

7.2 Principal Theoretical Conclusions

7.2.1 Research Question 1: Supply Chain Collaboration

The research outcomes on the supply chain collaboration construct consisted of four themes. For one of the themes (i.e. geography) there was no data from the research that could be mapped during the mapping step on the data analysis (Chapter 4). Another theme, overreliance on partners, although there was data mapped onto the theme during the mapping, it was apparent during the mapping exercise that it was very similar to the literature, therefore this was not discussed however the theme remains on the conceptual map. The two themes that were selected for discussion were: collaboration

as a driver and power asymmetry based on the insights from the research.

7.2.1.1 Similarities with extant literature for RQ1: Supply Chain Collaboration

Regarding collaboration as a driver, the research outcomes were consistent with the literature regarding the importance of supply and value chain or network collaborations in driving the implementation of a CE as identified by Hussain and Malik (2020) in Chapter 2. The research outcomes also showed consistency with the literature regarding how collaborations provide a conducive atmosphere for knowledge sharing, alignment of interests and driving the innovation required for the transition to a CE as identified by both Tura et al. (2019) and Berardi and de Brito (2021) in Chapter 2.

Regarding power asymmetry in supply chain collaborations, the research outcomes were consistent with the literature that the strong bargaining power of an organisation on the supply chain, based on relative size and position on the supply chain resulted in those firms dictating and imposing on the other supply chain partners as identified by Berardi and de Brito (2021) and Franco (2017) in Chapter 2. The research outcomes also showed consistency with literature identified by Berardi and de Brito (2021) and Brito and Miguel (2017) that when the power between partners was balanced, this ensured the longevity of the supply chain collaborations. Franco (2017) also identified that the size trumps position when it comes to power asymmetry. This was not tested in this research as the research sample only consisted of large organisations.

Based on the work done on this study, the study identified areas of similarities with the extant literature on collaboration as a driver and power asymmetry under the supply chain collaboration construct, and this is a potential addition to the body of knowledge

7.2.1.2 Nuances of difference to extant literature for RQ1 (sub-themes)

The research outcomes revealed a nuance of difference to the literature stating that size and position on the supply chain resulted in those firms dictating and imposing on the other supply chain partners as identified by Berardi and de Brito (2021) and Franco (2017) in Chapter 2. The research outcomes showed that due to the unique B-BBEE legislation in the South African context regarding Supplier and Enterprise Development (SED/ED) programs, these collaborations had better success with managing the power asymmetry dynamics of collaboration. In these cases, the size and position of the smaller enterprises had no impact as the power asymmetry was neutralised by the legislative incentives. This nuance was related to legislation that is country specific and provides incentives to larger corporates for supplier development, thus having an impact on the power asymmetry role in the collaborations for a CE and was therefore an area of

potential refinement of the extant literature.

7.2.1.3 Distinct differences to extant literature for RQ1 (themes)

There were no distinct differences between the research findings and the literature relating to Research Question 1.

7.2.1.4 Conclusions for RQ1: Supply Chain Collaborations

The principal theoretical conclusions on Research Question 1: How the supply chain collaborations drive the transition towards a circular economy were separated into similarities and differences. The research outcomes found similarities with the literature reviewed in the following areas: collaboration as a driver of transition to a circular economy, and power asymmetry in collaborations. This therefore adds to the body of knowledge on supply chain collaborations as a driver of the transition to a circular economy.

The research outcomes presented some nuances of difference with the literature reviewed in the following areas: Power asymmetry: Supplier/Enterprise Development incentives under the Broad Based Black Economic Empowerment legislation in South Africa. This is therefore an area of potential refinement on supply chain collaborations as a driver of the transition to a circular economy and is presented as a subtheme in Figure 6.

7.2.2 Research Sub-Question 1: Partner selection and partner capabilities

The research outcomes on the partners selection construct consisted of four themes. For one of the themes (i.e., knowledge sharing experience) there was no data from the research that could be mapped during the mapping step on the data analysis (Chapter 4). Another theme, i.e., innovation capability, although there was data mapped onto the theme during the mapping, it was apparent during the mapping exercise that it was very similar to the literature, therefore this was not discussed however the theme remains on the conceptual map. The three themes that were selected for discussion were: complementary capabilities, financial capability and partner due diligence based on the insights from the research.

7.2.2.1 Similarities with extant literature for Research SubQuestion 1

Regarding complementary capabilities, the research outcomes were consistent with the literature regarding inward-looking capability gap assessment as identified by Jager and

Piscicelli's (2021) in Chapter 2. The research findings also showed consistency with Veleva and Bodkin's (2018) findings regarding the complementary nature of small entrepreneurial firms' strong innovation capabilities and flexibility but deficient in financial muscle and scale, to the larger corporates who had funding but lacked agility. The research outcomes revealed consistency with literature by Berardi and de Brito's (2021) proclamation that supply chain partners could combine their individual resources and thus leverage the complementarities in a manner that enhanced the implementation of CE initiatives. Berardi and de Brito's (2021) statement that these collaborations extended beyond the buyer-supplier dyad and engaged players from several value chains and stakeholders in the supply network was also corroborated by the research outcomes.

This is a potential addition to the body of knowledge on the role of partner selection and partner capabilities in supply chain collaborations for a circular economy.

7.2.2.2 Nuances of difference to extant literature for RQ1 SubQuestion 1 (sub-themes)

Regarding the theme of financial capability, the research outcomes revealed a nuance of difference to the literature that entrepreneurial firms (who lack access to finance) could collaborate with larger firms (who lack agility to innovate) would close this gap and leverage the complementary capabilities of the partners to accelerate the transition towards a circular economy as identified by Veleva and Bodkin's (2018) in Chapter 2. The research outcomes were that the financial capability of a partner was considered a pre-requisite in selecting a partner, over and above expertise and networks.

7.2.2.3 Distinct differences to extant literature for RQ1 SubQuestion 1 (themes)

Regarding the partner due diligence, the research outcome was that the theme appears to not have been discussed in the extant literature. This was seen as an area of distinct difference. This was therefore included as a potential new theme in the revised framework.

7.2.2.4 Conclusions for RQ1 SubQuestion 1

The principal theoretical conclusions on RQ1 Sub-Question 1: The role of partner selection and partner capabilities in supply chain collaborations were separated into similarities, nuances of difference and distinct differences.

The research outcomes found similarities with the literature reviewed in the following areas: complementary capabilities and innovation capabilities. This therefore adds to the body of knowledge on partner selection and partner capabilities for supply chain

collaborations.

The research outcomes presented some nuances of difference with the literature reviewed in the following areas: financial capability was found to be a prerequisite in the research outcomes whereas the literature identified it as a potential trade-off when there were complementing capabilities. This is therefore an area of potential refinement on partner selection and partner capabilities and is presented as a subtheme in Figure 6.

The research outcomes found distinct differences form the literature reviewed in that the partner due diligence appears not to have been discussed in the extant literature. This was therefore included as a potential new theme in the revised framework.

7.2.3 Research Sub-Question 2: Managing the collaborative relationships

The research outcomes on the relationship management construct consisted of six themes. For one of the themes (i.e., lack of trust) there was no data from the research that could be mapped during the mapping step on the data analysis (Chapter 4). For three other themes, namely, alignment of interest, governance and lack of transparency, although there was data mapped onto the themes during the mapping, it was apparent during the mapping exercise that it was very similar to the literature, therefore this was not analysed further, however the themes remain on the conceptual map. The two themes that were selected for discussion were: communication, and partner support based on the insights from the research.

7.2.3.1 Similarities with extant literature for Research SubQuestion 2

Regarding communication, the research outcomes showed consistency with the literature that continuous flow of information, knowledge sharing or regular communication between the supply chain partners played an important role in the success of the collaborative relationships as identified by Berardi and de Brito (2021 and Tura et al. (2019) in Chapter 2. The research outcomes further corroborate Tura et al.'s (2019) findings that information sharing platforms for multiple stakeholders was a key driver of supply chain collaboration for the transition. The research outcomes were consistent the knowledge exchange enhancing the longevity of the relationships as identified by Berardi and de Brito (2021) in Chapter 2.

7.2.3.2 Nuances of difference to extant literature for Research SubQuestion 2 (sub-themes)

There were no nuances of difference identified under Reaserch Sub-Question 2.

7.2.3.3 Distinct differences to extant literature for Research SubQuestion 2 (themes)

Regarding the partner support, the research outcome was that the theme of partner support in supply chain collaborations appeared to not have been discussed in the extant literature. This was seen as an area of distinct difference. This was therefore included as a potential new theme in the revised framework.

7.2.3.4 Conclusions for Research SubQuestion 2

The principal theoretical conclusions on RQ1 Sub-Question 2: Relationship management mechanisms in supply chain collaborations were separated into similarities, nuances of difference and distinct differences.

The research outcomes found similarities with the literature reviewed in the following areas: communication, alignment of interest, governance and lack of transparency. This therefore adds to the body of knowledge on relationship management mechanisms for supply chain collaborations.

The research outcomes found distinct differences to the literature reviewed in that the partner support appeared not to have been discussed in the extant literature. This was therefore included as a potential new theme in the revised framework.

7.2.4 Research Sub-Question 3: Barriers and Enablers of the transition

The research outcomes on the barriers and enablers construct consisted of two main themes, barriers and enablers. Under barriers there were three sub-themes. For one of the sub-themes, i.e., lack of legislation, although there was research data mapped onto the sub-theme, it was apparent during the mapping exercise that it was very similar to the literature, therefore this was not analysed further, however the sub-theme remains on the conceptual map. Two sub-themes were selected for discussion based on the insights from the research, and these were: cost and lack of coordination.

Under enablers there were three sub-themes. All three sub-themes were selected for discussion based on the insights from the research, and these were: company culture and mindset, global frameworks and advocacy (which was relabelled to consumer advocacy).

7.2.4.1 Similarities with extant literature for Research SubQuestion 3

Regarding barrier: lack of coordination the research outcomes showed consistency with the literature that the coordinating relationships amongst supply chain partners was one of the obstacles to transitioning for implementation of the reverse logistics in circular business models as identified by Berardi and de Brito (2021) in the review done in Chapter 6.

Regarding barrier: cost, the research outcomes showed consistency with the literature by Hina et al. (2022) and Berardi and de Brito (2021) who identified that the inherent additional costs associated with sustainability initiatives was a barrier to the transition to circularity. The research outcomes revealed consistency with the literature concluding that significant investment required for transition was not only in product redesign but also in the training of employees in the production and selling of circular products as identified by Hina et al. (2022). The research outcomes also corroborated Hina et al.'s (2022) assertion that austerity measures were an internal barrier to the transition and with literature by Kirchherr et al. (2018) that the cost comparison with virgin inputs had an impact of the uptake of recycled materials.

Regarding enabler: organisation culture and mindset the research outcomes showed consistency with the literature on the organisational mindset shift being a vital first step to enable a company to transition towards a circular economy as identified by Batista et al. (2018), Hussain and Malik (2020) and Korhonen et al. (2018).
The research outcomes were also consistent with both Hussain and Malik (2020) and Tura et al.'s (2019) observations that the staff members' awareness about sustainability and a greater understanding of the economic benefits of a CE promoted a transition to circularity. The research outcomes further supported Tura et al.'s (2019) assertion that the company vision and strategy rhetoric cement the understanding and awareness amongst its employees.

7.2.4.2 Nuances of difference to extant literature for Research SubQuestion 3 (sub-themes)

Regarding barrier: lack of coordination the researcher identified a nuance of difference in the research outcomes regarding lack of supply chain coordination in global CE legislation, timing of transitioning in different countries, defiant industry players with vested interests in protecting legacy unstainable businesses as well as industry bodies whose efforts were not coordinated. These differences do not appear to be in the

literature that was reviewed. This was therefore shown as a potential new sub-theme labelled as “lack of institutional coordination” in the amended framework in Figure 6.

Regarding barrier:cost, the researcher identified a nuance of difference between the literature and the research outcomes that the niche nature of circular products and small production runs were a driver of price increases and thus contributed to the cost of transitioning. This appears to not have been discussed in the literature that was reviewed. The researcher will treat this as a potential refinement of existing literature, and this was reflected as a subtheme of the barriers theme, labelled “economies of scale”.

Regarding the sub-theme enabler:Global Frameworks there was a nuance of difference identified that the sub-theme of Global Frameworks as an enabler for organisations to transition towards a circular economy appeared to not have been discussed in the extant literature. This was seen as an area of difference, and this was included as a potential new sub-theme under enablers in the revised framework Figure 6.

Regarding the sub-theme enabler:advocacy the researcher identified a nuance of difference that the sub-theme of individual advocacy as an enabler for organisations to transition towards a circular economy appeared to not have been discussed in the extant literature. This was seen as an area of difference and consumer advocacy was therefore included as a potential new sub-theme under enablers in the revised framework in Figure 6.

7.2.4.3 Distinct differences to extant literature for Research SubQuestion 3 (themes)

There were no distinct differences noted on Research Sub-Question 3 about barriers and enablers.

7.2.4.4 Conclusions for Research SubQuestion 3

The principal theoretical conclusions on Research Sub-Question 3: barriers and enablers of the transition to a circular economy were separated into similarities, nuances of difference and distinct differences.

The research outcomes found similarities with the literature reviewed in the following areas - barriers: cost, lack of supply chain coordination, and enablers: organisation culture and mindset. This therefore adds to the body of knowledge on barriers and enablers for the transition to a circular economy.

The research outcomes found nuances of difference within the subthemes of barriers: lack of institutional coordination, economies of scale, and enablers: global frameworks and consumer advocacy which appeared not to have been discussed in the extant literature. These were therefore included as potential new sub-theme in the revised framework.

7.2.5 Research Question 2: Sustainable development outcomes

The research outcomes on the sustainable development outcomes construct consisted of four themes. Three of the themes, i.e., long-term objectives, environmental preservation, and economic outcomes, although there was research data mapped onto the themes during the data analysis done in Chapter 4, it was apparent during the mapping exercise that it was very similar to the literature, therefore these themes were not analysed further, however the themes remain on the conceptual framework. The theme selected for discussion based on the insights from the research was the social outcomes.

7.2.5.1 Similarities with extant literature for Research Question 2

Regarding social outcomes, the research outcomes showed consistency with the literature in that through supply chain collaborations between large firms and entrepreneurial firms, the CE could facilitate social outcomes like creating employment, education and training opportunities, unlocking access for previously disadvantaged communities, and promoting social equity as identified by both Sudusinghe and Seuring (2022) and Veleva and Bodkin (2018).

7.2.5.2 Nuances of difference with extant literature for RQ2 (sub-themes)

Regarding social outcomes, the researcher identified a nuance of difference between the research outcomes and the literature. The research outcomes were that there was a high focus on social outcomes in the context of South Africa and Africa as embedding social compliance extended to ensuring responsible sourcing throughout the value chain to protect human rights. This appeared to contrast Sudusinghe and Seuring's (2022) and Veleva and Bodkin's (2018) findings that the attention of CE studies and CSCs was on environmental preservation and economic performance with very little attention to the social aspects. The researcher will treat this as a potential refinement of existing literature, and this was reflected as a subtheme (country context) of the sustainable development social outcomes in the revised conceptual framework.

Another nuance of difference identified in the research outcomes was how the restoration process (for a mine closure) facilitated social outcomes through the reskilling and training of the communities and previous supply chain partners in alternative skills to ensure their continued livelihoods beyond the mine's existence which was unique in that the social outcomes were dissociated from the core economic activities of the lead firm. The researcher will treat this as a potential refinement of existing literature, and this was reflected as a subtheme (sector context) of the sustainable development social outcomes in the revised conceptual framework.

7.2.5.3 Distinct differences to extant literature for RQ2 (themes)

There were no distinct differences with extant literature noted on RQ2 about sustainable development outcomes.

7.2.5.4 Conclusions for RQ2

The principal theoretical conclusions on RQ2: sustainable development outcomes were separated into similarities, nuances of difference and distinct differences.

The research outcomes found similarities with the literature reviewed in the following areas – social outcomes, long term objectives, environmental preservation, and economic outcomes. This therefore adds to the body of knowledge on sustainable development outcomes from the transition to a circular economy.

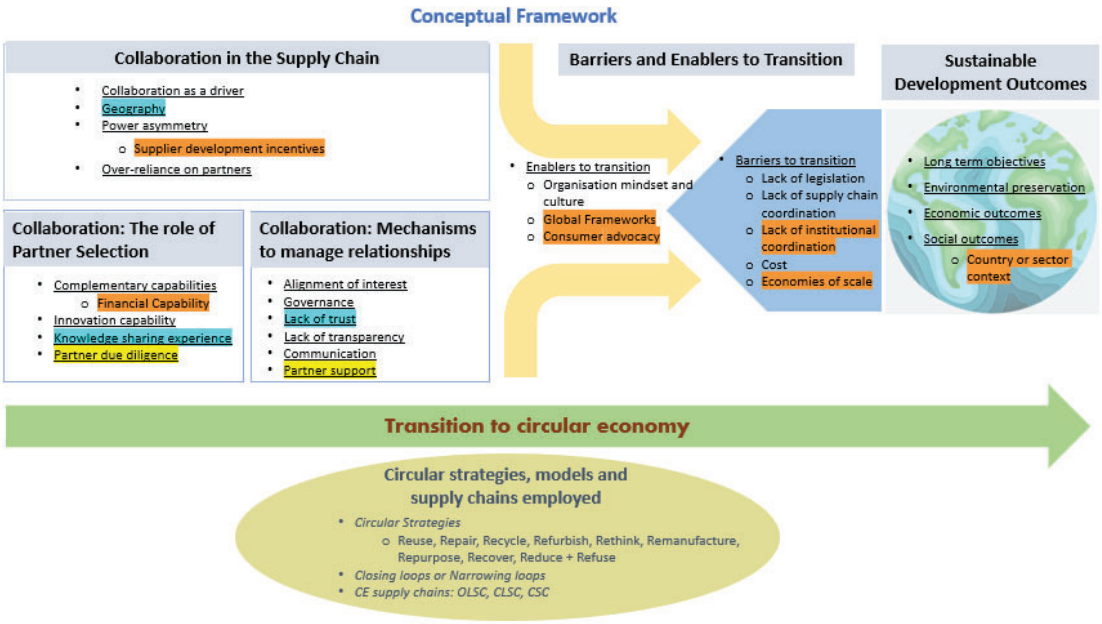
The research outcomes had nuances of difference with the extant literature on the theme of social outcomes, the country context and sector context appeared not to have been discussed in the extant literature. These were therefore included as potential new sub-theme, country and sector context under social outcomes in the revised conceptual framework.

7.2.6 Amended Conceptual Framework

The conceptual framework in

 is same framework as that presented at the end of Chapter 6 but has been reworked for better communication of the research conclusions

Figure 7: Final Conceptual Framework



7.3 Research Contribution

This research aimed to explore and gain new insights into the supply chain collaborations for a circular economy. The intended contributions were to make a theoretical contribution related to the circular economy supply chain collaborations literature. The research contributions are divided into three categories: additions to the body of knowledge, refinements of the body of knowledge and potential extensions of the body of knowledge.

7.3.1 Additions to the body of knowledge

Based on the work done on this study, there is a potential contribution in the following areas that appears to be similarities and therefore a potential contribution to the body of knowledge are potential additions, as presented in Table 20 below.

Table 20: Potential additions to the body of knowledge

Theoretical Construct	Themes	Subthemes
Supply chain collaboration	• Collaboration as a driver • Power asymmetry • Overreliance on partners	
Partner selection	• Complementary capabilities • Innovation capability	
Relationship management	• Alignment of interest • Governance • Lack of transparency • Communication	
Barriers and enablers	• Barriers	○ Lack of legislation ○ Lack of supply chain coordination ○ Cost
	• Enablers	○ Organisation culture and mindset
Sustainable development outcomes	• Long-term objectives • Environmental preservation • Economic outcomes • Social outcomes	

This study had a different setting and a specific scope and analysis compared to other studies that have been done before that appear in the extant literature. Therefore, even where the conclusions are found to be similar, this is considered as adding to the body of knowledge by demonstrating the literature conclusions to be true in the context of this research.

7.3.2 Potential refinements to the body of knowledge

Based on the work done in this study, there appears to be a potential contribution to the body of knowledge in the following areas which appear to be nuances of difference and are therefore a potential refinement to the body of knowledge. The areas of potential refinement are illustrated in Table 21 as new subthemes highlighted in yellow.

Table 21:Potential refinements to the body of knowledge

Theoretical Construct	Themes	Subthemes
Supply chain collaboration	• Collaboration as a driver • Power asymmetry • Overreliance on partners	○ Supplier development incentives
Partner selection	• Complementary capabilities • Innovation capability	○ Financial Capability
Relationship management	• Alignment of interest • Governance • Lack of transparency • Communication	

Barriers and enablers	• Barriers	○ Lack of legislation ○ Lack of supply chain coordination ○ Cost ○ Lack of institutional coordination ○ Economies of scale
	• Enablers	○ Organisation culture and mindset ○ Global Frameworks ○ Consumer advocacy
Sustainable development outcomes	• Long-term objectives • Environmental preservation • Economic outcomes • Social outcomes	○ Country or sector context

7.3.3 Potential extensions to the body of knowledge

Based on the work done on this study, there is a potential contribution in the following areas that appear to be distinct differences and therefore are potential extensions of the body of knowledge. The areas of potential extension to the current literature are illustrated in Table 22 as new themes highlighted in green.

Table 22: Potential extension to the body of knowledge

Theoretical Construct	Themes	Subthemes
Supply chain collaboration	• Collaboration as a driver • Power asymmetry • Overreliance on partners	○ Supplier development incentives
Partner selection	• Complementary capabilities • Innovation capability • Partner due diligence	○ Financial Capability
Relationship management	• Alignment of interest • Governance • Lack of transparency • Communication • Partner support	
Barriers and enablers	• Barriers	○ Lack of legislation ○ Lack of supply chain coordination ○ Cost ○ Lack of institutional coordination ○ Economies of scale
	• Enablers	○ Organisation culture and mindset ○ Global Frameworks ○ Consumer advocacy
Sustainable development outcomes	• Long-term objectives • Environmental preservation • Economic outcomes • Social outcomes	○ Country or sector context

7.4 Recommendations for Management and other Stakeholders

The recommendations for management and other stakeholders are organised by each research construct and are drawn from the theoretical conclusions particularly where there were differences identified between the research outcomes and the current literature. The recommendations were directed at business leaders, big brands/corporates, industry bodies, financial and education institutions as indicated.

7.4.1 Recommendations on partner selection

- The partner selection process should start with an internal assessment, followed by market research and understanding of possible or available solutions prior to seeking potential partners. Management must develop due diligence tools to assess partners upfront. This could be in the form of a detailed questionnaire with a decision tree matrix that covers areas of capability, value chain analysis and long-term critical success factors.
- Financial institutions should get involved in providing access to finance by designing novel financing instruments that are customised for the circular economy transition. These should be aimed at unlocking the financing gaps experienced by small firms who have viable innovations but lack funding as well as instruments targeted at supporting large firms who require capital injections to transition their business models. Consideration should be made to include financiers as critical stakeholders of the supply chain collaboration partnerships. This should be seriously considered by Developmental Finance Institutions in particular.

7.4.2 Recommendations on managing collaborative relationships

- Lead firms must be willing to share resources, build capacity through training and other support for their supply chain partners to enhance the long-term sustainability of the collaborations and viability of the transition to a circular economy.

7.4.3 Recommendations on barriers and enablers

- Managers must establish an organisation culture of sustainability within their organisations over time. This culture then needs to be formalised into a vision and values that are aligned to a sustainability mindset. A sustainability mindset would be more effective than any legislation in facilitating the transition as compliance driven change tends to not get integrated into long term practices
- Management should build a greater understanding of the economic benefits of a circular economy and develop an ability to perform value chain analysis and unpack

hidden costs to develop credible business cases for the transition.

- Business leaders must ensure that their organisations are affiliated or are signatories to a credible global sustainability institution which provide a framework, best practice and guidelines for the transition journey including how to prioritise and effectively execute the transformation of their business models towards circularity.
- Government, large corporates and education institutions should collaborate and invest in consumer education about sustainable products, the impacts of unsustainable practices and how to dispose responsibly. This would make a significant contribution towards the transition and support business' efforts in transitioning towards circularity. This would not only increase consumer advocacy, putting pressure on more businesses to transition, but indirectly address the economies of scale as circularity would start to become more mainstream.
- Government, through legislation, should assist industry bodies in playing a coordinating and facilitation role to direct the various initiatives in each key sector. Responsibility for unpacking and analysing the value chain must be assigned such that the transition is coordinated for maximum impact and efficient allocation of resources.

7.4.4 Recommendations on sustainable development outcomes

- Organisations operating in South Africa, together with government and education institutions should leverage the large number and growing population of youth who are predominantly unskilled and unemployed. This resource could be leveraged through education that is targeted at the circular economy by providing training programs on technology as well as entrepreneurial skills. This would allow South Africa to take advantage of the economic growth opportunities presented by the circular economy whilst delivering social outcomes like job creation, improvement of livelihoods and reducing inequalities. Similarly, in the rest of Africa in countries who share the level of high unemployment and inequalities could adopt similar strategies.

7.5 Limitations of the Research

This section discusses the limitations of the study as a whole. The limitations of the research design and methods were discussed in Chapter 4 (refer to section 4.12 on page 57).

- This study explored the supply chain collaborations for a circular economy in four specific sectors, namely fast-moving consumer goods, packaging, mining and construction. Furthermore, the research participants were purposefully selected

based on the defined criteria in the research design, are individuals working for organisations based in South Africa, operating primarily in South Africa and the rest of Africa. The limitation was that the outcomes of the study related to those specific sectors in those specific geographic regions.

- This study explored supply chain collaborations for organisations involved in the transition towards a circular economy. The limitation was that the research outcomes may only be applicable to those types of supply chain collaborations and not supply chain collaborations in general.
- This study identified potential new themes under supply chain collaborations such as: partner due diligence and partner support. The study also identified potential new subthemes, namely, supplier development incentives and financial capability, but the limitation was that this study did not explore this in further detail.
- This study identified potential new subthemes under barriers: lack of institutional coordination and economies of scale as well as under enablers: global frameworks and consumer advocacy, but the limitation was that this study did not explore this in further detail.
- This study identified a potential new subtheme of country or sector context under sustainable development outcomes, but the limitation was that this study did not explore this in further detail.

7.6 Suggestions for Future Research

It was noted from the literature reviewed that there was a need for deeper understanding and insights into the circular economy, its drivers and enablers and in particular, the critical enabler being the supply chain collaborations required to transform traditional business models into circular business models. The researcher has identified a few areas that are considered important to contribute further to the body of knowledge and could complement to the outcomes of this research. These are suggested for future research to enhance a deeper understanding of these phenomenon. The suggested future research areas were separated into two categories, namely, research scoping and research questions.

7.6.1 Suggested future research scoping

The research scope was limited to organisations based in South Africa therefore, although some participants worked for multinationals, their experiences were biased towards the South Africa and the African context. Future research should examine the country specific nuances of difference that were identified in this research in more detail.

Future studies could examine the features of the SA or African context that results in these nuances, whether it can be attributed to the nature of an emerging economy, the levels of social inequalities or the prevalent legislation aimed at addressing those social inequalities. These future studies could be performed in a context of other emerging economies or contexts with similar levels of social inequalities.

The research design utilised purposive sampling that was targeted at individuals involved in supply chain collaborations for a CE in multiple sectors. Future research could take the form of a case study and focus on either a single organisation's business model transition including its supply chain partners involved in those collaborations, or an industry level case study. This would provide deeper insights into the individual experiences of each the role player experienced within the same case. Future research could be designed to incorporate other sectors to gain further insights on the sector context.

7.6.2 Suggested future research on emerging themes

The research study identified areas of potential differences with the extant literature that required further attention and deeper understanding.

Supply chain collaboration construct

Under the supply chain collaboration construct, there were potential new themes and sub-themes that were identified but could not be explored in more depth. Future research could seek deeper insights into the themes: *partner due diligence* and *partner support* and the sub-themes: *supplier development incentives* and *financial capability*.

Future research could develop deeper understanding of the role of financial capability in the formation of the partnerships and explore whether this presents a capability trade-off or disqualifies potential partners. Future research could explore how willingness to train, support and build capacity in the partnership impacts the collaboration outcomes.

Barriers and enablers to the transition

Under the barriers and enablers construct, there were potential new sub-themes that were identified but the researcher did not go into more depth. Other researchers could look in more depth at the sub-themes: *lack of institutional coordination*, *economies of scale*, *global frameworks,* and *consumer advocacy*.

Sustainable development outcomes

Under the sustainable development outcomes construct, there was a potential new sub-theme that was identified but could not be explored in further detail. Future research

could explore in more depth the sub-theme of the *country and sector context* under social outcomes. Researchers could seek new insights into what sector or country nuances impact on the sustainable development outcomes related to social outcomes.

7.7 Conclusion

The research problem explained in the introductory chapter revealed the opportunity presented by the circular economy to businesses and society through leveraging the new opportunities to create competitive advantage. The transformation of business models and supply chain collaborations signalled an opportunity for a country like South Africa to leverage the large unemployed youth population and the key role played by small businesses in the economy in exploiting the transition to a circular economy. The main obstacle highlighted in Chapter 1 and 2 was that business lacked the supporting frameworks to navigate this new territory. Academia play an important role in developing the knowledge, concepts and theories that have practical implications to entrench new ways of doing business.

The research investigated supply chain collaboration on the transition to a circular economy and its contribution to sustainable development through the experiences of participants in three key industries. These industries were selected for their prominence in current discussion about the circular economy. The researcher sought to find areas of potential contribution to the current literature through addition, refinement, or extensions to the body of knowledge. In the end, a conceptual framework was developed which consisted of potential contributions, refinements and extensions on the initial framework defined in Chapter 2.

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APPENDIX A – CONSISTENCY MATRIX

Table 23: Consistency Matrix

Research questions / propositions	Section in Literature Review	Data collection tools	Analysis techniques
CE Context	**2.3 Circular Economy Definitions** • Berardi and de Brito (2021) • Geissdoerfer et al. (2017) • Geissdoerfer et al. (2018) • Govindan and Hasanagic (2018) • Kirchherr et al. (2017) • Kirchherr et al. (2018)	N/A	• N/A
CBM Context	**2.4 Types of Circular Business Models** • Chen et al. (2020) • Geissdoerfer et al. (2017) • Geissdoerfer et al. (2018) • Hina et al. (2022) • Salvioni et al. (2022)	N/A	• N/A
SSC Context	**2.5 Sustainable Supply Chain Evolution** • Batista et al. (2019) • Berardi and de Brito (2021) • Hussain and Malik (2020)	N/A	• N/A
RQ1: *What is the role of supply chain collaboration in the transition towards a circular economy*?	**2.6 Supply Chain Collaboration** • Berardi and de Brito (2021) • Hina et al. (2022) • Hussain and Malik (2020) • Jager and Piscicelli (2021) • Tura et al. (2019)	Semi-structured interview protocol	• First level coding on open-ended exploratory questions • Thematic analysis to develop constructs
SQ1*: What role do partner selection and partner capabilities play in the sustainability of supply chain collaboration?*	**2.8 Partner Selection and Capabilities** • Berardi and de Brito (2021) • Jager and Piscicelli (2021) • Tura et al. (2019) • Veleva and Bodkin (2018)	Semi-structured interview protocol	• First level coding on open-ended exploratory questions • Thematic analysis to develop constructs
SQ2*: What mechanisms are used to manage collaborative relationships in the supply chain collaborations?*	2.9 Relationship Management Mechanisms • Berardi and de Brito (2021) • Brito and Miguel (2017) • Hina et al. (2022) • Shekarian (2020) • Tura et al. (2019)	Semi-structured interview protocol	• First level coding on open-ended exploratory questions • Thematic analysis to develop constructs
SQ3*: What are the barriers and enablers*	**2.10 Barriers and Enablers** • Batista et al. (2018) • Hoffman (2019)	Semi-structured interview protocol	• First level coding on open-ended exploratory questions

to transition towards a circular economy?	• Hussain and Malik (2020) • Maione et al. (2022) • Kirchherr et al. (2018) • Korhonen et al. (2018)		• Thematic analysis to develop constructs
SQ3*: How does the transition to a circular economy lead to sustainable development?*	**2.11 Sustainable Development Outcomes** • Berardi and de Brito (2021) • Geissdoerfer et al. (2017) • Geissdoerfer et al. (2018) • Geissdoerfer et al. (2020) • Kirchherr et al. (2017)	Semi-structured interview protocol	• First level coding on open-ended exploratory questions • Thematic analysis to develop constructs

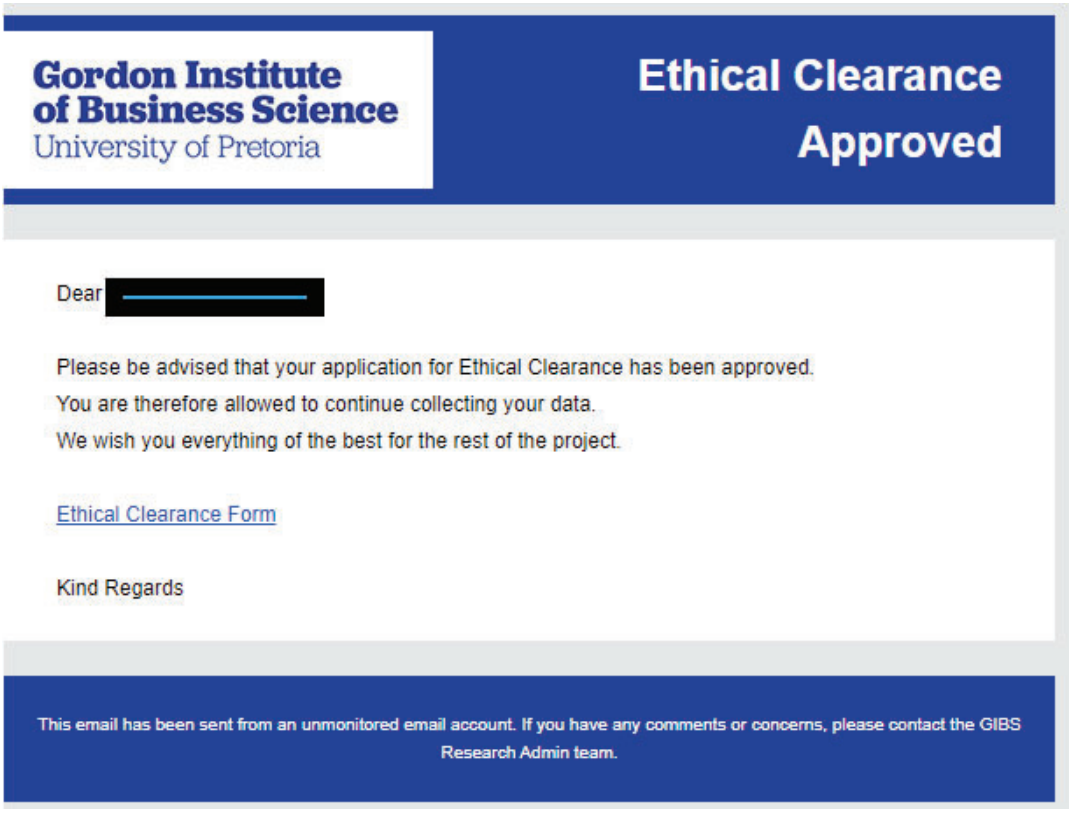
APPENDIX B - RESEARCH INSTRUMENT

Interview Protocol used for the semi-structured interviews

Kick-off question	Can you please tell me how you got involved in sustainability?
Q1	What are your expectations and expected outcomes that, based on your experience, you are hoping to achieve from the sustainability initiative(s)?
Q2 *Research Question 1 - What is the role of supply chain collaboration in the transition towards a circular economy*	Please can you tell me about your experience of how supply chain collaboration drives sustainability or sustainable outcomes?
Q3 *Research SubQuestion1: What role do partner selection and partner capabilities play in the supply chain collaboration?*	This is a good point to move into my next question, and this next question has two parts. The first part is, please could you tell me, what your experience has been on what is the role of partner selection in achieving the expected outcomes? Secondly, linked to that, please tell me what you have experienced to be the role of partner capabilities in achieving the expected outcomes?
Q4 *Research SubQuestion2: What mechanisms are used to manage collaborative relationships in the supply chain collaborations?*	In your experience, how do you manage the collaborative relationships and what are the key ways that you do this?
Q5 *Research SubQuestion2: What mechanisms are used to manage collaborative*	Please tell me, in your experience, what other mechanisms, tools, processes and so forth are used to manage the collaborative relationships?

relationships in the supply chain collaborations?	
Q6 *Research SubQuestion3: What are the barriers and enablers to transition towards a circular economy?*	My next question again has two parts to it: Firstly, what, in your experience have been the key challenges in collaborating towards sustainability in your supply chains? And secondly, linked to that, what has enabled you to overcome these challenges or what have you done, and continue to do, to overcome the challenges?
Q7 *RQ2 - How does the transition to a circular economy lead to sustainable development?*	I am now going to move to my next question which I will ask in two parts, the first part is as follows: 7.1 What are the outcomes that you have you achieved so far? And the second part to that question is: 7.2 Could you consider, whether and to what extent these outcomes may be described as circular or could lead to a circular economy?
Closing question	To close off the interview, could you tell me how you see this developing into the future?
Further Questions	The following questions may be asked as and when required during the interview 3) Probing questions: c) I wonder if you could tell me more about that? d) I wonder if you could give me an example to illustrate that? 4) Clarification question: b) Could you clarify what "…." means?

APPENDIX C – ETHICAL CLEARANCE APPROVAL



Gordon Institute of Business Science
University of Pretoria

Ethical Clearance Approved

Dear [redacted]

Please be advised that your application for Ethical Clearance has been approved.
You are therefore allowed to continue collecting your data.
We wish you everything of the best for the rest of the project.

Ethical Clearance Form

Kind Regards

This email has been sent from an unmonitored email account. If you have any comments or concerns, please contact the GIBS Research Admin team.

APPENDIX D – PROFORMA INFORMED CONSENT

Informed consent for interviews

> ***Note:*** *This standard informed consent letter to be used in qualitative interviews, must be separate from interview guide, must be signed before the interview commences. The signed form must be stored separately from the data collected*

I am conducting research on supply chain collaboration for sustainable development. Our interview is expected to last between 45 minutes to one hour and will help us understand your experience in supply chain collaboration for sustainability. **Your participation is voluntary and you can withdraw at any time without penalty.** By signing this letter, you are indicating that you have given permission for:

- The interview to be recorded;
- The recording to be transcribed by a third-party transcriber, who will be subject to a standard non-disclosure agreement;
- Verbatim quotations from the interview may be used in the report, provided they are not identified with your name or that of your organisation;
- The data to be used as part of a report that will be publicly available once the examination process has been completed; and
- All data to be reported and stored without identifiers.

If you have any concerns, please contact my supervisor or me. Our details are provided below.

Researcher name: NOKHWEZI NHASSENGO
Email : 21846074@mygibs.co.za
Phone : 082 885 7769

Research Supervisor name: DR JILL BOGIE
Email : bogiej@gibs.co.za

Signature of participant: _____

Date: _____

Signature of researcher: _____

Date: _____

APPENDIX E – PROFORMA TRANSCRIBERS NON-DISCLOSURE AGREEMENT

APPENDIX F – CODE BOOK FROM ATLAS.TI

Count	Code
1	ability to measure outcomes
2	ability to measure outcomes: ability of companies to demonstrate sustainability claims is a challenge
3	ability to measure outcomes: creating supply chains with transparent outcomes
4	ability to measure outcomes: unmeasurable targets lead to greenwashing
5	access to partner networks
6	access to partner networks: partner networks enhance outcomes
7	achieved circular outcomes
8	achieved circular outcomes: circular means reuse recycle and improve efficiency
9	achieved circular outcomes: closing the loop on packaging waste
10	achieved circular outcomes: recycling considered as circular
11	achieved circular outcomes: reducing carbon footprint and waste considered circular
12	achieved circular outcomes: renewable energy for production
13	achieved circular outcomes: unrecyclable plastic to eco-bricks
14	Address local context issues
15	Address local context issues: how can Africa leapfrog industrilisation in a sustainable manner
16	Address local context issues: integrating local context into goals
17	Address local context issues: objective to have all parties treated fairly on mine closure
18	Address local context issues: objective to reskill so suppliers have livelihoods
19	Africa will prioritise primary needs
20	Africa will prioritise primary needs: Africas priority basic needs before sustainability
21	Africa will prioritise primary needs: circular economy drive just transition
22	Africa will prioritise primary needs: first world wealth based on unsustainable practices
23	Africa will prioritise primary needs: job creation and improving livelihoods
24	alignment of objectives
25	alignment of objectives: all stakeholders must understand the process
26	alignment of objectives: establish alignment upfront prior to contracting
27	alignment of objectives: iterative process with many meetings to align
28	alignment of objectives: jointly agree on targets and path
29	alignment of objectives: mutual benefits encourages collaboration and cements relationship
30	alignment of objectives: understand own deliverables and partner expectations
31	alignment of objectives: understand suppliers needs and capabilities
32	alignment of purpose
33	alignment of purpose: collaborate with like-minded partners
34	alignment of purpose: not individual mandate but partnership goals
35	Alignment on expectations
36	Alignment on expectations: align on who will get credit for success
37	Alignment on expectations: iron out expectations before signing
38	Alignment on expectations: partnership expectations
39	Alignment on expectations: strategic partnerships to align future goals and requirements
40	although EPR inflationary on price it will stimulate the economy long term
41	anchor common language
42	anchor common language: anchor in a framework of business language (cost, risk, opportunity and intangible v
43	anchor common language: anchor sustainability language on global frameworks
44	appropriate allocation of accountability
45	appropriate allocation of accountability: accountability and transparency
46	appropriate allocation of accountability: all stakeholders have accountability
47	appropriate allocation of accountability: assign a role to each stakeholder
48	appropriate allocation of accountability: channel to raise issues or concerns
49	appropriate allocation of accountability: give accountability where it belongs
50	appropriate communication method
51	appropriate communication method: appropriate communication channels per stakeholder
52	appropriate communication method: consider purpose of meeting if one-on-one or broad imbizo appropriate
53	appropriate communication method: engagement platform must allow for interaction
54	award for innovation in sustainable packaging formulation
55	Balance economic social and environmental
56	Balance economic social and environmental: best solutions for environment must be evidence based
57	Balance economic social and environmental: transition must balance economic, social and environmental aspe
58	Balance profit, development and environment
59	Balance profit, development and environment: Balance profitability with taking care of human rights and the env
60	Balance profit, development and environment: beyond profit
61	Balance profit, development and environment: build shared value
62	Balance profit, development and environment: Future generation not suffer because of todays business operatio
63	Balance profit, development and environment: leave the environment better if not the same as before
64	Balance profit, development and environment: putting more than you take out
65	Balance profit, development and environment: sustainability at the centre of growth agenda

66	brand perception
67	brand perception: Benchmarking and copying what similar companies are doing
68	brand perception: consumer lens builds case to internal stakeholders
69	brand perception: discarded unsustainable packaging looks bad for the brand
70	brand perception: sustainable practices impact brand perception
71	circular economy ecosystem
72	circular economy ecosystem: circular economy requires ecosystem to support
73	circular economy ecosystem: circular economy thinking ensures product life cycle considered at design
74	circular economy ecosystem: collaborate throughout the supply chain
75	circular economy ecosystem: collaboration is enabler
76	circular economy ecosystem: collaboration with internal and external stakeholders
77	circular economy ecosystem: each supply chain partner contributes to the goal
78	circular economy ecosystem: inclusive supply chain has ecosystem wide view of sustainabililty
79	circular economy ecosystem: plastic best material if within circular economy designs
80	circular economy ecosystem: research and development plays a role
81	circular economy ecosystem: supply chain enables the ecosystem
82	Commercial viability improved
83	Commercial viability improved: commercially viable sustainable solutions
84	Communities more involved
85	Communities more involved: communities part of process creating sustainability
86	Communities more involved: consumer education and awareness
87	Communities more involved: individuals become more conscious and spin off to businesses
88	company protocols and systems
89	company protocols and systems: company protocols and systems to manage relationships
90	company protocols and systems: framework on relationship management
91	company vision and mindset
92	company vision and mindset: global framework membership provides access to best practice
93	company vision and mindset: leadership sets the tone on sustainability strategies
94	company vision and mindset: matching company purpose with environmental impact
95	company vision and mindset: sustainability mindset entrenched for years
96	Complementary capabilities
97	Complementary capabilities: focus on core strengths
98	Complementary capabilities: partner must complement capabilities
99	Complementary capabilities: partner selection influences innovation capacity
100	Complementary capabilities: partners address pressing sustainability challenges
101	Complementary capabilities: partners to reduce waste from packaging
102	Complementary capabilities: partnership with waste collector to reduce landfill
103	Complementary capabilities: partnerships scale the impact
104	Complementary capabilities: reduce footprint by return to recycling partners
105	Complementary capabilities: types of partners play different roles in the supply chain
106	Complementary capabilities: understand own contribution to the supply chain
107	conduit for capital
108	conduit for capital: corporate supply chain tool to address negatives and implement positives
109	conduit for capital: supply chain core to thinking about sustainability agenda
110	conduit for capital: supply chain deploys capital towards SDGs
111	contracts
112	contracts: contractual arrangements to govern relationship
113	contracts: self-motivated partners
114	contracts: some successful partnerships without agreements
115	corruption in supply chains
116	corruption in supply chains: political interference in supply chains
117	corruption in supply chains: SA challenge for supply chains is tender corruption
118	cost is considered but reliability and quality first
119	create circular economies
120	create circular economies: 100% products in primary packaging made from majority recycled content
121	create circular economies: circular way of doing business becomes mainstream
122	create circular economies: create circular economies and reduce waste
123	create circular economies: fundamental shift from sustainable to circular
124	create circular economies: goal to create a world where materials reused
125	create circular economies: opportunities in building materials industry
126	create circular economies: outcome expected to keep plastics circulating
127	cross industry knowledge sharing
128	cross industry knowledge sharing: knowledge sharing across industries and countries
129	cross industry knowledge sharing: leadership required to bring industry collaboration
130	cross sector dependencies

131	cross sector dependencies: carbon emission targets rely on supply chain partners
132	cross sector dependencies: carbon footprint for imported product depends on actions of shipping lines
133	cross sector dependencies: climate risk and declarations involve entire value chain
134	cross sector dependencies: collaborate with competitors to build scale
135	cross sector dependencies: collaboration enables achievement of results
136	cross sector dependencies: extending sustainability practices to organisations in your supply chain is difficult
137	cross sector dependencies: regulation in one sector forces sustainability practices across the supply chain
138	cross sector dependencies: rely on suppliers to achieve sustainable packaging targets
139	cross sector dependencies: responsible sourcing practices of your suppliers
140	cross sector learning
141	cross sector learning: company case inspired industry compliance
142	cross sector learning: learnings for other sites and competitors
143	cross sector learning: organisational actions have global level impact
144	cross sector learning: plastics model applied to other industries
145	customised evaluation models
146	customised evaluation models: different models for mandatory vs beyond compliance spend
147	customised evaluation models: ring-fence projects to go around stringent procurement rules
148	defending legacy investments
149	defending legacy investments: advocating unsustainable industries to support legacy investments
150	defending legacy investments: lack of agility
151	difficult to assess capability upfront
152	difficult to assess capability upfront: challenge to know if partner can actually deliver
153	difficult to assess capability upfront: suppliers self assessment of ability to deliver
154	difficult to assess capability upfront: uncertainty about the partner
155	diverse perspectives add value
156	diverse perspectives add value: activists provide different perspective into issues
157	do own market research upfront
158	do own market research upfront: understanding what is out there in the market
159	education and training
160	education and training: educate about the benefits of sustainability
161	education and training: educate supply chain partners about sustainability
162	education and training: training connects global reality to your organisation
163	Embedment of circular thinking
164	Embedment of circular thinking: circular economy business case embedded
165	Embedment of circular thinking: circular economy design out waste from beginning
166	Embedment of circular thinking: circularity will require mindset shift across industries
167	Embedment of circular thinking: feeling impacts of climate change will make environmental preservation volunta
168	Embedment of circular thinking: innovation required to design out the end problem
169	Embedment of circular thinking: integrated view of sustainability aspects will bring long term success
170	Embedment of circular thinking: sustainability entrenched by senior leadership
171	evaluation criteria
172	evaluation criteria: Internal knowledge of standards equip supply chain to know what to look for
173	evaluation criteria: monitoring and tracking to investigate trends
174	evaluation criteria: Procurement sets standards of how sustainable partners are scored
175	evaluation criteria: supply chain partners must change requirements to support the transition
176	evaluation criteria: Sustainability assesses safety health and environment on selection
177	financial capability also considered
178	financial capability also considered: financial capabililty required in partner selection
179	financial capability also considered: funding capability
180	Funding unlocked
181	Funding unlocked: COP26 outcomes align international standards for funding
182	Funding unlocked: link ideas with the right funding
183	Funding unlocked: research incentives for circular studies
184	Future generations considered
185	Future generations considered: preserve environment for future generations
186	global backing shortens innovation time
187	global comany with good financial and technical backing is enabler
188	holistic view
189	holistic view: a holistic drive enables smooth transition to sustainable practices
190	holistic view: can only be achieved as a collective
191	holistic view: global goals enable collaboration
192	holistic view: whole organisation mindset shift
193	incentive to reduce cost
194	incentive to reduce cost: challenge to get funding allocated
195	incentive to reduce cost: expectation that sustainability is embedded

196	incentive to reduce cost: supply chain incentivised to reduce cost
197	increased brand value
198	increased brand value: outcome of gaining trust and market opportunities through visibility
199	increased recycling
200	increased recycling: achieved 50% increase in glass recycling
201	increased recycling: financial benefits of recycling have been demonstrated
202	increased recycling: recycled content target in packaging
203	Increased returnables and recycled content
204	Increased returnables and recycled content: portfolio has returnable bottles or majority recycled content
205	individuals drive change
206	individuals drive change: Consumer involvement will increase speed of transition
207	individuals drive change: extreme weather events drivng individuals to think about environmental impact
208	individuals drive change: Initiatives like YSIP encourage rethinking sustainability
209	individuals drive change: locally the drive is a pull from customers end
210	industry platforms
211	industry platforms: industry bodies provide collaboration platform
212	industry platforms: industry platforms used to drive sustainability agenda
213	information sharing
214	information sharing: knowledge and information sharing builds relationships
215	information sharing: risk aversion impedes information sharing
216	innovative and entrepreneural nature of South Africans
217	integrated strategies
218	integrated strategies: circular economy business platform for Africa
219	integrated strategies: integrated strategy to bring ideas to commercialisation
220	interdepartmental representation
221	interdepartmental representation: each department represented in meetings with partners
222	interdepartmental representation: ensure all roleplayers are represneted in discussions
223	interdepartmental representation: include all internal stakeholders
224	interdepartmental representation: integrate supply chain partner as part of internal team
225	interdepartmental representation: R&D falls under engineering but works on supply chain sustainability
226	interdepartmental representation: supplier management seperate from sustainability department
227	interdepartmental representation: understand internal stakeholders needs
228	lack of key resources
229	lack of key resources: difference between technical and commercial viability
230	lack of key resources: funding and staffing limitations
231	lack of key resources: lack of resources to unlock business case
232	lack of legislation
233	lack of legislation: government must enable venture capital for circular solutions
234	lack of legislation: risk of stringent compliance hindering SMMEs
235	lack of legislation: voluntary reporting is a challenge slows down progress
236	lack of skills and education
237	lack of skills and education: Companies dont have inhouse ESG or sustainability professionals
238	lack of skills and education: how does a services business apply circular thinking?
239	lack of skills and education: lack of skills and education in sustainability
240	legislative framework
241	legislative framework: compliance with new EPR legislation
242	legislative framework: framework for plastic recycling in SA
243	legislative framework: influencing regulation that affects constituency
244	legislative pressure
245	legislative pressure: due to cost some will not adopt standards voluntarily
246	legislative pressure: European end of supply chain ahead of implementation due to regulation
247	legislative pressure: government enables collaboration through legislation
248	legislative pressure: government should facilitate collaboration to support policies
249	legislative pressure: legislation enables supply chain partners to move with same pace
250	legislative pressure: policy and regulation enables supply chain collaboration
251	legislative pressure: pressure from financiers and regulators push organisations to adapt
252	legislative pressure: regulation driving behavior change
253	less environmental damage
254	less environmental damage: eco labeling scheme for building products that are environmentall friendly
255	less environmental damage: Eco-labeling includes building materials as well as cleaning materials utilised
256	less environmental damage: ecolabeling based on life cycle assessments
257	less environmental damage: electricity from renewable sources
258	leverage partnerships
259	leverage partnerships: leveraging partnerships to resolve challenges
260	leverage partnerships: lobby decision makers

261	leverage partnerships: lobby for funding initiatives
262	leverage partnerships: networking and communication
263	leverage partnerships: unlock sharing of knowhow through collaboration
264	Local solutions for local issues
265	Local solutions for local issues: local skills for local beneficiation
266	Local solutions for local issues: localisation and inclusivity
267	Local solutions for local issues: opportunity to empower entrepreneurs meaningfully
268	Local solutions for local issues: opportunity to utilise BBBEE ESD and ED to build capabilities
269	long term commitment
270	long term commitment: long term collaboration between business and government
271	long term commitment: resilience to push agenda
272	long term commitment: short term needs with long term objectives
273	long term orientation
274	long term orientation: long term relationships
275	long term orientation: longest standing partnership goes above and beyond
276	maturity of relationships
277	maturity of relationships: long term commitment
278	mindset of decision makers
279	mindset of decision makers: buy-in from internal stakeholders
280	mindset of decision makers: changing the mindset is difficult step
281	mindset of decision makers: circular thinkig is not commonplace
282	mindset of decision makers: competing priorities slow things down
283	mindset of decision makers: corporate bureaucracy
284	mindset of decision makers: some senior people believe sustainability is for high revenue companies
285	mindset of decision makers: translating vision to local context
286	misplaced priorities
287	misplaced priorities: commercial imperatives interplay with sustainability aspirations
288	misplaced priorities: compliance penalties weighed against cost of compliance
289	misplaced priorities: inequality a barrier to transitioning
290	misplaced priorities: net-zero is reactive not what is required
291	misplaced priorities: prioritising credit over impact
292	missing elements of ecosystem
293	missing elements of ecosystem: inefficient waste management services lead to plastic pollution
294	missing elements of ecosystem: linear thinking is a challenge
295	More enabling policies
296	More enabling policies: external pressure required to force rethinking
297	More enabling policies: policies to hold corporates accountable
298	Net zero by 2040
299	Net zero by 2040: target to achieve net zero by 2040
300	new opportunities
301	new opportunities: circular economy pilots as industrialisation tool
302	new opportunities: compliance unlocks funding and market opportunities
303	no circular solutions available
304	no circular solutions available: no circular solution for multilayer waste yet
305	no circular solutions available: services sector behind on circular, manufacturing closer to CE
306	no commercial benefits achieved
307	no commercial benefits achieved: partnership beneficial for sustainability but no financial benefit
308	no long term orientation
309	no long term orientation: collaboration is short term and needs-driven
310	no long term orientation: lack of transparency in supply chain outcomes
311	no long term orientation: sometimes partner not willing to learn stuck in agreement
312	no sustainability metrics in supply chain
313	no sustainability metrics in supply chain: no sustainabiilty metrics in public sector supply chain
314	no sustainability metrics in supply chain: PFMA not much consideration for sustainability
315	no sustainability metrics in supply chain: Sustainable performance new territory for public sector supply chain
316	not leveraging technology
317	not leveraging technology: lack of technological information
318	not leveraging technology: technology is underutilised
319	not sharing information
320	not sharing information: competition laws restrict information sharing
321	not sharing information: historical investment creates barrier to new thinking
322	not sharing information: lack of sharing information on current research
323	not sharing information: lack of transparency about objectives
324	packaging to prevent food waste
325	partner capability to transition

326	partner capability to transition: partners must have capability of transitioning to circular
327	partner expertise and experience
328	partner expertise and experience: experience improves foresight
329	partner expertise and experience: experienced partners add value
330	partner expertise and experience: experts as partners provide best practice advice
331	partner expertise and experience: experts assist with designing sustainability solutions
332	partner expertise and experience: it is not the solution it is who is providing it
333	partner expertise and experience: partner experience is important
334	partner expertise and experience: share private sector expertise and knowledge
335	partner expertise and experience: technical expertise key partner capability
336	partner expertise and experience: understand communities needs and context
337	partner misalignment
338	partner misalignment: challenge is differing expectations and finding middle ground
339	partner misalignment: culture of expecting handouts
340	partner misalignment: enterprise development responsible for partner yet impact is mostly to the sustainability
341	partner misalignment: External events force changes to contract terms
342	partner misalignment: obligation to build partners capability takes time
343	partner misalignment: partnership turnover impedes traction
344	partner misalignment: SA supply chains characterised by SMEs who lack capabilities
345	partner misalignment: SMEs specialist in core business/service but not sustainability targets
346	partner misalignment: some partners self-serving not fulfil agreement
347	partner's sustainability performance matters
348	partner's sustainability performance matters: Inhouse sustainability officer key capability
349	partner's sustainability performance matters: partners who seem to be sustainable matter for public image
350	partner's sustainability performance matters: some competent partners lack elements of sustainability complic
351	partner's sustainability performance matters: supplier selection includes environmental parameters
352	partner's sustainability performance matters: suppliers must also track and report emissions
353	partner's sustainability performance matters: suppliers must have capacity and sustainability mindset
354	partners transition at difference paces
355	partners transition at difference paces: challenge with supplier not agreed to new terms of transition to circular
356	partners transition at difference paces: global trends and developments affects local supply chains
357	partners transition at difference paces: organisations adapting at different speeds
358	performance management
359	performance management: compliance with contract audited to manage relationship
360	performance management: meetings to monitor and track deliverables
361	performance management: partnership perfomance management
362	Post consumer waste solutions
363	Post consumer waste solutions: need framework for upcycling to eliminate landfill
364	Post consumer waste solutions: plastic solution lies in treatment of post consumer waste
365	power balance
366	power balance: consider partners inputs
367	power balance: flexible to hear what partners want
368	power balance: having a flexible perspective
369	power balance: key to understand the role and impact of each supply chain party
370	power balance: scheduling flexibility demonstrate willingness to accommodate others
371	power balance: unequal power in corporate supply chains
372	prioritise based on impact
373	prioritise based on impact: use 80/20 principle to prioritise focus areas
374	product life cycle thinking
375	product life cycle thinking: full cycle journey of product is recorded
376	product value chain ignored
377	product value chain ignored: carbon footprint not considered in alternative packaging
378	proof of concept
379	proof of concept: accelerator program to involve startups in supply chain
380	proof of concept: entrepreneurs key to test solutions
381	proof of concept: localised impact in own value chain
382	proof of concept: pilot scale to build knowhow
383	proof of concept: using pilots to build credibility
384	public private procurement collaboration
385	public private procurement collaboration: private sector procurement processes support government
386	qualty is imperative product must deliver as promised
387	reduce carbon footprint
388	reduce carbon footprint: linking carbon footprint and procurement
389	reduce carbon footprint: reduce carbon emissions by 25% across value chain
390	reduce carbon footprint: shorten supply chain through beneficiation

391	reducing consumption and waste
392	reducing consumption and waste: diversion of waste from landfill
393	reducing consumption and waste: Green energy initiatives and reducing usage
394	reducing consumption and waste: outcome achieved reducing plastic content in packaging by 1%
395	reducing consumption and waste: outcome reducing waste volume and charges
396	reducing consumption and waste: prevent plastics in the ocean
397	regular communication
398	regular communication: clear and honest communication
399	regular communication: engage those negatively affected by the change
400	regular communication: platforms to facilitate conversations
401	regular communication: regular interactions
402	regular communication: regular team check-ins
403	regular communication: use communication tools to keep everyone informed
404	repurposing solutions
405	repurposing solutions: flexible packaging technology for astro turf
406	repurposing solutions: food waste and green waste to compost
407	repurposing solutions: organic waste as feed to black soldier flies
408	repurposing solutions: organic waste to produce biogas
409	repurposing solutions: outcomes is finding alternative uses for single use plastics
410	repurposing solutions: using methane waste gas to generate electricity
411	repurposing solutions: waste ash product to build houses
412	repurposing solutions: waste repurposing and producer reposnsibility
413	repurposing solutions: waste water stream to irrigate small farm
414	research and development
415	research and development: R&D does studies how to reduce carbon footprint
416	research and development: research required for evidence based decisions
417	reuse solutions
418	reuse solutions: bottle return initiative through consumers and taverns
419	reuse solutions: high percentage of returnables back in the supply chain
420	reuse solutions: water treatment plants to reuse waste water
421	rigorous assessment of partners
422	rigorous assessment of partners: Dig deeper to understand suppliers supply chain
423	rigorous assessment of partners: set of questions to ask potential partners
424	rigorous assessment of partners: suppliers supply chain impacts on production
425	risk mitigation is demanded by the FMCG and brand owners
426	role of facilitator
427	role of facilitator: administrative facilitator optimises decisions
428	role of facilitator: neutral party coordinating partnership
429	senior leadership sponsor
430	senior leadership sponsor: have decision makers around the table
431	senior leadership sponsor: strategic objectives drive meaningful collaboration
432	shift individual mindsets
433	shift individual mindsets: accountability for full impact on the world
434	shift individual mindsets: achieve systemic change
435	shift individual mindsets: advocacy drives mindset change
436	shift individual mindsets: change hearts and minds of people to influence business
437	shift individual mindsets: change peoples mindsets
438	shift individual mindsets: communities put pressure on business to implement sustainable initiatives
439	shift individual mindsets: goal is to go beyond what is required by compliance
440	shift individual mindsets: shift mindset to long term impacts
441	shifting mindsets
442	shifting mindsets: rethinking impact of sponsoring an event
443	shifting mindsets: value for business in going greener
444	slow progress
445	slow progress: changing scope due to new legislation is difficult to implement
446	slow progress: legislation takes time to change behaviors
447	slow progress: takes time to achieve change
448	Small businesses have key role
449	Small businesses have key role: sustainability movement driven by SMEs would be most effective
450	social equity
451	social equity and inclusion
452	social equity and inclusion: achieved social compliance embedment
453	social equity and inclusion: circular economy leads to social and economic inclusion in Africa
454	social equity and inclusion: social equity in value chain as an outcome
455	social equity and inclusion: social value achieved as communities benefit though jobs and skills

456	social equity and inclusion: supply chain collaboration to find localised solutions
457	social equity and inclusion: supply chain partner up the value chain
458	social equity and inclusion: upskilling employees to live beyond mine closure
459	social equity: identify local expertise first and allocate opportunities
460	social equity: Procurement incorporates social compliance
461	social equity: Social aspect is a pivot point to achieve environmental sustainability
462	social equity: social aspects easier to achieve than environmental aspects
463	social equity: social element more critical in South African context
464	social equity: social sustainability aspects embedded in BBBEE legislation
465	sourcing trade-offs
466	sourcing trade-offs: events changed focus on sustainability
467	sourcing trade-offs: price sensitive regions prioritise availability vs sustainability
468	sourcing trade-offs: strategic partnerships for reliability of supply
469	spans across operational activities
470	spans across operational activities: complete system view
471	spans across operational activities: government and community as supply chain stakeholders
472	spans across operational activities: less silo mentality
473	spans across operational activities: NGOs part of the supply chain
474	spans across operational activities: plan source make deliver
475	spans across operational activities: product logistics must incorporate waste collection
476	spans across operational activities: supply chain as producer to customer or one point of delivery to another
477	spans across operational activities: supply chain can facilitate responsible sourcing
478	spans across operational activities: supply chain extends from raw material to reclaimed/disposal
479	spans across operational activities: supply chain from plant to warehouse, distribution and finally customer
480	spans across operational activities: supply chain makes procurement decisions thus critical to sustainable per
481	spans across operational activities: supply chain most impacted in scaling down for mine closure
482	stage of transition informs selection
483	stage of transition informs selection: align partner selected with stage and pace of transition
484	stakeholder engagement
485	stakeholder engagement: engage early for buy-in
486	stakeholder engagement: engage, network, inform and educate to effect change
487	stakeholder engagement: government leaders must engage consituencies prior to passing legislation
488	stakeholder engagement: involve internal stakeholders in partner selection
489	stakeholder mapping
490	stakeholder mapping: Relationship approach based on level of influence and interest
491	stakeholder mapping: stakeholder mapping develop strategy for each relationship
492	standardised reporting
493	standardised reporting: All inclusive and verified reporting
494	standardised reporting: gathering and verifying data from suppliers and distributors
495	stimulates innovation
496	stimulates innovation: collaboration brings roleplayers to develop solutions
497	stimulates innovation: offer customers s sustainable packaging option by 2025
498	stimulates innovation: rethinking the problem and solution
499	stimulates innovation: sustainability innovation showcase
500	strategic agility
501	strategic agility: Agility of SMEs in supply chains is advantageous
502	strategic agility: continuous innovation and optimisation beyond current targets
503	strategic agility: maintain a level of agility
504	strategic agility: short term contracts to maintain agility
505	Supply chain impacts environmental targets
506	Supply chain impacts environmental targets: Emissions from supply chain more than production
507	Supply chain impacts environmental targets: manufacturing supply chain is environmental compliance
508	Supply chain impacts environmental targets: supply chain drives mostly environmental sustainability
509	supply chain manages relationships
510	supply chain manages relationships: Procurement manages suppliers through Coupa
511	supply chain manages relationships: relationship managed by procurement, sustainability does reporting
512	supply chain manages relationships: SED and ED programs to manage relationships
513	supply chain manages relationships: SQM departments monitors supplier audits and compliance
514	support supply chain partners
515	support supply chain partners: efficiency tools specific to each role and output
516	support supply chain partners: support partners to capacitate delivery of their obligations
517	support supply chain partners: supporting each other in the transition
518	sustainability initiatives come at a cost
519	sustainability initiatives come at a cost: challenge is availability and cost
520	sustainability initiatives come at a cost: cost factor is a challenge to supply chain collaboration

521	sustainability initiatives come at a cost: lower scale economies for sustainable options increase costs
522	sustainability initiatives come at a cost: premium price inherent barrier to innovation and collaboration
523	sustainability initiatives come at a cost: sustainability innovation comes with increased cost
524	sustainability of ecosystems
525	sustainability of supply
526	sustainability of supply: culture of importing technology not creating
527	sustainability of supply: lack of alternatives to shipping lines allows unsustainable practices
528	sustainability of supply: load shedding switch to diesel increases emissions
529	sustainability of supply: pandemic put focus on sustainability of the supply chain
530	sustainable farming
531	targets must be measurable
532	targets must be measurable: measurable outcomes
533	technology as a tool
534	technology as a tool: systems and applications to support compliance
535	technology as a tool: technology enables communication
536	technology as a tool: virtual meetings improve global supply chain communication
537	tone on ethical standards
538	tone on ethical standards: set the tone about ethical imperatives
539	track hidden costs
540	track hidden costs: hidden costs are the business case
541	track hidden costs: planet sustainability should be the business case
542	track hidden costs: sustainability council to track expenditure
543	transition to circular
544	transition to circular: circular economy transition will create new markets
545	transition to circular: current outcomes are leading to a circular economy
546	transition to circular: currently transitioning towards circular but no organisation is fully circular
547	transition to circular: developing a circular economy road map and action plan
548	transition to circular: ecolabeling scheme and certification standards consider life cycle therefore lead to circula
549	transition to circular: plastic thinking as transition to circular
550	transition to circular: recycling could lead to circular
551	transition to circular: small incremental changes as outcomes
552	transition to circular: still far from achieving circular outcomes
553	transition to circular: sustainability becoming integrated into how we do business
554	Transition will be long
555	Transition will be long: most organisations have long journey to collaboration for sustainability
556	Transition will be long: transition will be a long process
557	transparency
558	transparency about goals
559	transparency about goals: transparency about goals enhance partnership performance
560	transparency about value sharing
561	transparency about value sharing: transparency ensures no surprises in how value created will be shared
562	transparency: open communication and consultation
563	transparency: open to share and learn
564	transparency: relationships based on trust
565	transparency: transparency avoids competition in managing relationships
566	transparency: transparent communication and managing feedback
567	value chain assessment
568	value chain assessment: Certification involves waste management, water, energy and proximity to transport
569	value chain assessment: rigorous assessment of interconnectivities
570	value chain assessment: system wide assessment prior to tackling a project
571	waste management systems
572	waste management systems: foster waste separation at source
573	waste management systems: integrated waste management required
574	waste management systems: organised system required for waste collection and separation to create jobs
575	waste management systems: waste seperation key to enable recycling
576	wide scope
577	wide scope: balance fit for purpose, innovative and standards compliance
578	wide scope: sustainability department deals with environmental sphere only
579	wide scope: too many industry initiatives dilute progress
580	widespread adoption to reduce costs
581	widespread adoption to reduce costs: increased economies of scale could reduce costs
582	willing to capacitate partners
583	willing to capacitate partners: assist supply chain partners to be more sustainable
584	willing to capacitate partners: building capacity and awareness enables collaboration
585	willing to capacitate partners: partnership to learn together
586	willing to capacitate partners: SMEs prioritised in partner selection and equiped to deliver
587	willing to capacitate partners: train partners to service you