Gordon Institute of Business Science
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Exploring green innovation: organisational resources and product and market reconception

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Philosophy in Business Management specialising in Change Leadership.

24 November 2025

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University of Pretoria

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 Change Leadership 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.

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ABSTRACT

This study investigates how organisations develop organisational resources (OR) to reconceive products and markets for green innovation (GI) in South-African organisations, addressing a gap between sustainability rhetoric and practical integration. Using an interpretivist, qualitative design, semi-structured interviews were conducted with 14 mid-to senior level leaders across various sectors (construction, consumer goods, FMCG, retail, pharmaceuticals, papermaking and recycling) and analysed through thematic analysis. Findings identify stakeholder pressure, including regulatory, customer, investor and competitor demands, as the primary external driver of GI, while leadership commitment, expressed through governance, personal conviction and resource allocation, functions as an important internal catalyst. Resource and integration constraints emerge as barriers. Core organisational resources enabling GI comprise employee green skills and empowerment, technology adoption coupled with knowledge-management systems, and embedded research-and-development practices. Additionally, external partnership collaborations and brand positioning can help to build market legitimacy and are essential for product and market reconception. The results underpin an updated conceptual framework linking drivers, barriers, organisational resources, offering managerial guidance for building dynamic capabilities and orchestrating stakeholder alignment to sustain GI. The study contributes to the sustainability literature by empirically mapping the resource-building processes of organisations operating under emerging-market constraints and by highlighting the nuanced interplay between internal capabilities and external pressures in achieving green product and market reconception.

KEYWORDS

Sustainability, Green Innovation, Organisational Resources, Dynamic Capabilities, Green Product Innovation, Green Process Innovation, Sustainability Mindset, Strategic Orientation, Strategic Green Brand Positioning, Leadership Commitment, Green Skills.

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Abbreviations

AC	Absorptive capacity
DCs	Dynamic capabilities
ESD	Enterprise supplier development
ESG	Environmental, social, governance
GHC	Green human capital
GI	Green innovation
IO	Innovation orientation
ORs	Organisational resources
SME	Small, medium enterprise
SO	Strategic orientation
RBV	Resource-based view
R&D	Research and development
ROI	Return on investment
VRIN	Valuable, rare, inimitable, and non-substitutable

1. Chapter 1: Introduction

1.1. Relevance of research from a business perspective

Organisations cannot hide from adopting sustainability practices in the face of rising demands from regulatory bodies, investors and consumers to decrease their negative environmental impact while maintaining competitiveness (Hammer & Somers, 2021; Khanra et al., 2022; Kramer & Pfitzer, 2016).

In its emergence, the sustainability debate was met with opposition from business and scholars who argued that business should focus on making profit for shareholders, while governments address society's environmental and social needs and challenges (Tate & Bals, 2018). Kramer and Pfitzer (2016) and other voices within the sustainability domain (Khanra et al., 2022) emphasise that government cannot undertake the task alone (Coghlan, 2024). As responsible citizens, business therefore plays an important role in helping solve some of society's challenges (Coghlan, 2024; Khanra et al., 2022; Kramer & Pfitzer, 2016). Business, as Adolph and Beckmann (2024) aptly put it, is better positioned to mobilise and lead positive sustainability outcomes, a sentiment that is echoed by Director-General of the World Trade Organization, Ngozi Okonjo-Iweala (Coghlan, 2024).

Green innovation (GI) offers a way forward, however, delivering it calls for a fundamental shift in how organisations operate (Hammer & Somers, 2021). Traditional models of innovation, sometimes siloed and reactive, are not suited to the scale or urgency of the sustainability challenge. Organisations must develop and adapt internal resources, including skills, knowledge, culture and processes, that enable them to innovate sustainably. Many organisations have started to explore environmentally sound approaches (Hammer & Somers, 2021), yet despite its importance there is limited understanding of how organisations actually build these capabilities in practice. How do they reconceive what they offer and who they serve in a way that delivers environmental and commercial value?

GI has become essential for businesses because it supports long-term economic stability, improves financial performance, and is now a basic requirement for staying competitive in global markets. Meeting global sustainability goals demands large-scale investment. For example, the G20 needs major annual financial commitments to meet both net-zero and economic inclusion goals (Ahuja et al., 2023). Although the exact

figures are high, the key point is that business plays an important role in closing this gap. Business-led innovation is expected to deliver a significant share of the transition, showing that organisations are essential actors rather than bystanders (Ahuja et al., 2023). This economic case naturally links to the financial value that GI creates for businesses themselves.

Organisations that integrate sustainability into their strategy consistently outperform their peers. Strong environmental, social and governance (ESG) performance is linked to better valuations and reduced risk from a financial perspective (Tansan et al., 2023). Organisations that combine ESG progress with growth and profitability deliver higher shareholder returns than those that focus solely on financial measures (Doherty et al., 2023). GI also supports top-line growth. More than half of the highest-performing organisations record strong annual revenue increases, and in industries like chemicals, organisations with low-carbon product portfolios significantly outperform laggards (Doherty et al., 2023). These organisations typically embed sustainability in their core strategy, invest heavily in innovation and strengthen governance by linking incentives to ESG goals (Doherty et al., 2023).

For organisations in emerging markets, strong sustainability performance is increasingly essential for competing globally. High ESG performers enjoy lower financing costs (Tansan et al., 2023). At the same time, new regulations such as carbon border taxes mean that organisations with lower emissions gain a cost advantage, particularly in energy-intensive sectors (Tansan et al., 2023). Consumer expectations reinforce this shift. Demand for environmentally responsible products is even stronger in emerging markets, where climate concern is high (Tansan et al., 2023). Sustainability leadership also attracts talent, which is especially important in markets with younger workforces (Tansan et al., 2023). Emerging-market climate leaders already show that decarbonisation and growth can go hand in hand.

Overall, the case for green innovation is clear. The global economy depends on it, businesses with strong ESG performance outperform financially, and access to key markets increasingly requires clear environmental action. Yet many established organisations risk being overtaken by new climate-technology disruptors (Bowcott et al., 2022). These new players succeed because they are purpose-driven, technologically strong and fast-moving, with cultures that encourage experimentation and calculated risk-taking (Bowcott et al., 2022).

This creates a critical gap. While the benefits and urgency are widely recognised (Ahuja et al., 2023; Tansan et al., 2023), there is still limited understanding of how established organisations can build the internal capabilities needed to deliver GI effectively. By examining how organisations develop and mobilise their organisational resources (ORs) to support this transition, this research addresses a timely business need. It offers a practical understanding of how organisations can integrate sustainability into strategy, operations, and market engagement in ways that create both environmental and commercial value.

This research will examine how organisations develop and mobilise their ORs to enable sustainable GI (Khanra et al., 2022). It will investigate the capabilities that support this shift, such as collaboration across functions, engagement with external stakeholders and ongoing organisational learning. It will also offer valuable insights for business leaders by unpacking how the changes occur in practice. In doing so, the research supports the urgent global agenda of aligning economic success with environmental responsibility.

The research exploration looks to guide organisations in achieving long-term sustainability and business resilience through GI. Organisations that understand how to maintain environmental responsibility alongside financial performance (Bataineh et al., 2024) will achieve long-term sustainability and generate positive effects. Businesses that are able to develop sustainable practices through resource cultivation can enter new markets while building loyal customer bases and achieving premium pricing opportunities (Ashraf et al., 2024). The study will explore how organisations build resources, which makes it easier to develop new, innovative eco-friendly and economically sound products or services as well as processes.

With this study, the researcher hopes to deliver practical knowledge which will help businesses both fulfil regulatory requirements and predict upcoming market developments to lead the transition toward a greener future. Businesses need to master the skills of navigating the shifting market environments where consumer preferences favour eco-friendly products, and global governments worldwide establish more stringent environmental regulations (Bhatia, 2021). The growing number of environmentally conscious consumers and stakeholders in the market allows organisations to achieve differentiation through proactive GI adoption (Bataineh et al., 2024).

1.2. Relevance of research from a theoretical perspective

Corporate sustainability is widely adopted, although Khanra et al. (2022) and Xie et al. (2019) highlight the limited knowledge in relation to the ways in which business effectively integrate sustainability visions into corporate strategies. Hammer and Somers (2021) echo this, particularly with regards to resource consumption of natural materials within the manufacturing arena. There is a gap in knowledge around understanding the practicalities of how sustainability can be embedded within organisations (Xie et al., 2019). This is particularly applicable for organisational environmental objectives with business recognising their responsibility to reduce their carbon emission footprint (Hammer & Somers, 2021). As pointed out by Begum et al. (2022), GI is a significant consideration for organisations that want to reduce their negative environmental effect by minimising the waste produced in their manufacturing processes (Hammer & Somers, 2021).

Despite the growing interest in sustainability, organisations still struggle to embed GI into their core strategies, limiting how they respond and adapt to their market demands and regulatory pressures. Also, business leaders are looking to increase profitability of their sustainability efforts (Hammer & Somers, 2021) This is why the opportunity to explore this dilemma was selected as there is clearly a growing need for businesses to align environmental goals with profitability (Khanra et al., 2022).

While GI is a growing body of knowledge (Xie et al., 2019), Khanra et al. (2022) underscore that it has only gained popularity over the last two decades, with increased intensity in more recent years. The dearth of studies assessing GI as a strategic organisational resource points to there being a need to explore the construct (Khanra et al., 2022; Tuấn, 2022). Currently, as Khanra et al. (2022) and Xie et al. (2019) posit, organisations are concerned about how they can profitably benefit from GI. The research aims to uncover insights by delving more into how organisations prioritise ORs to achieve sustainability goals via GI. By exploring how organisations use their ORs to implement GI to drive sustainability, the study offers insight into how they can rethink product and process design sustainably and profitably. This will help scholars and practitioners to reconceptualise ORs in creating or enhancing product and process design to respond to markets dynamics (Khanra et al., 2022).

The study will extend the body of knowledge in exploring GI, thus GI as a strategic organisational resource, aligning to Khanra et al.'s (2022) future research

recommendation. This is because although growing, research about GI outcomes does not fully explain how organisations create essential ORs needed for its support.

Additionally, the existing literature has room to increase the comprehension of the internal capability-building processes that support the underdeveloped field of green product and process innovation which remains an underdeveloped field (Awan et al., 2021). The insufficient focus on internal organisational processes prevents researchers from fully understanding the core elements that lead to successful GI. Thus, the inquiry will provide additional insight and help both scholars in the reconception of ORs in creating or enhancing product and process design to respond to market dynamics (Khanra et al., 2022).

Although literature recognises the value of GI, it remains unclear how organisations actually build the organisational resources that allow them to embed sustainability in practice. Existing studies highlight the importance of internal factors such as leadership, knowledge and skills, as well as external influences such as regulation and stakeholder expectations, but they do not fully explain how these drivers translate into concrete processes for developing and applying organisational resources for GI (Khanra et al., 2022; Xie et al., 2019). Similarly, while the RBV and dynamic capabilities frameworks point to the importance of resource development and adaptability, the specific mechanisms through which organisations mobilise these capabilities for green product and market innovation are not well established (Bhatia, 2021; Wang & Juo, 2021). This leaves a notable gap in understanding how organisations use their resources not only to innovate internally but also to rethink what they offer and the markets they engage with. These gaps directly shape and justify the research questions for this study, which are designed to unpack the drivers, processes and outcomes of organisational resource development for sustainable GI.

1.3. Research questions

Khanra et al. (2022) highlight an important gap in current scholarship by calling for future research that examines GI as a strategic organisational resource. Although interest in GI has grown, there is still limited understanding of how organisations actually build and mobilise the internal resources and capabilities required to support it (Khanra et al., 2022). This recommendation provides the academic anchor for the main research question of this study.

Integrating environmental goals into broader organisational strategies is something that many organisations still grapple with, particularly in integrating sustainability principles into practical, actionable work (Khanra et al., 2022; Wang and Juo, 2021; Xie et al., 2019). Organisations often lack clarity on how to develop and use their ORs effectively to achieve superior sustainability outcomes, especially when the goal is to reconceive products and markets for GI (Wang and Juo, 2021). Thus, the research aims to shed light on the persistent gap in understanding how organisations operationalise sustainability through internal resource mobilisation and capability-building (Khanra et al., 2022; Xie et al., 2019).

Guided by these limitations in the literature, the study poses the following main research question (RQ):

Main RQ:
How do companies develop ORs to reconceive products and markets to drive sustainable GI?

To explore this question in depth, the study is supported by three sub-questions. Each sub-question connects directly to gaps identified in existing literature and helps break down the main research problem into focused areas of investigation (Bhatia, 2021; Khanra et al., 2022; Xie and Zhu, 2020):

RQ1 - What internal and external factors drive companies to develop organisational resources for sustainable green innovation?
Although various scholars examine leadership, stakeholder expectations and regulatory pressures, the literature still lacks clarity on the full set of internal and external forces that motivate organisations to invest in and develop resources for GI (Xie et al., 2019; Wang and Juo, 2021).

RQ2 - How do companies build and leverage organisational resources and dynamic capabilities to support green innovation initiatives?
While the RBV and dynamic capabilities frameworks highlight the importance of internal competencies, there is limited empirical understanding of the specific organisational processes through which these resources and capabilities are actually developed and applied in the context of GI (Bhatia, 2021; Khanra et al., 2022).

RQ3 - In what ways do the development and deployment of organisational resources enable companies to reconceive their products and markets for sustainability?

Existing studies do not fully explain how resource development translates into product redesign, market repositioning, or broader shifts in market engagement driven by sustainability imperatives (Khanra et al., 2022; Xie and Zhu, 2020).

These research questions address the gap identified by Khanra et al. (2022) and provide a pathway for understanding how organisations build the foundations necessary for successful and profitable GI. The key constructs explored under this study are GI and ORs.

1.4. Research aims

The study is guided by the need to respond directly to the gaps identified in the literature, particularly the limited understanding of how organisations develop and mobilise their ORs to embed sustainability in practical, actionable ways (Khanra et al., 2022; Xie et al., 2019). The aim of this research is therefore to explore how companies build the internal foundations and capabilities needed to reconceive their products and markets for sustainability. It focusses specifically on how ORs are developed, combined, and deployed to support GI.

Building on this overarching aim, the research seeks to generate insight into the factors that motivate organisations to invest in GI, the internal processes they use to strengthen their ORs. It also explores how these resources enable new forms of product and market reconception. By focusing on these areas, the enquiry aims to unpack how organisations move from sustainability aspirations to concrete organisational action.

A further aim of the research is to offer practical and valuable insights for managers and decision-makers. By understanding how organisations coordinate resources, foster collaboration, and develop dynamic capabilities, the study hopes to offer guidance on how sustainability efforts can be integrated more effectively into organisational strategy and everyday operations.

Finally, the study aims to create a conceptual framework that brings together the key constructs and themes emerging from the research. This framework is intended to

support scholars and practitioners by offering a structured view of how ORs can be cultivated and applied to drive sustainable GI and long-term business resilience.

1.5. Research contributions

This research aims to contribute towards the growing literature on GI by offering an in-depth view of how organisations develop and mobilise their ORs to support sustainable innovation. By examining the internal capabilities, constraints, and resource-building practices across multiple sectors, the research offers practical and theoretical refinements to the current literature on ORs, dynamic capabilities, and GI.

A number of subthemes emerged from the study that offer potential contributions to the GI discourse:

- GI (drivers)
  - Regulatory compliance and environmental standards as core motivators for GI.
  - Customer and market (investors and shareholders) demand for sustainable products, pushing organisations to adapt offerings.
- GI (barriers)
  - Budgetary and financial limitations, which shape how organisations prioritise sustainability efforts.
  - Fragmented organisational integration, which slows down or weakens sustainability execution.
- ORs
  - Building organisational capability and green skills infrastructure as well as R&D, which strengthens readiness for GI.
  - Technology management and knowledge sharing, which helps organisations use new information effectively.
  - Partnerships for capacity building, which expand access to expertise and innovation opportunities.
  - Educating and engaging the conscious consumer, which helps organisations reposition their brands for sustainability.

Essentially, the research provides a potential contribution to GI literature by:

- Further clarifying how ORs are built and combined to support sustainable innovation, an area highlighted as under-explored by Khanra et al. (2022).

- Offering insight into capability-building processes, particularly the practical mechanisms through which organisations strengthen skills, knowledge, integration and collaboration to support GI.
- Developing a conceptual framework outlining key constructs and exploring how organisations mobilise resources to reconceive products and markets for sustainability.

1.6. The scope of the research

1.6.1. Theoretical scope

The study is centred on understanding how organisations develop, strengthen and mobilise their ORs to drive GI. The focus is on the practical processes through which skills, knowledge, technology, partnerships and internal structures are built and combined to enable sustainability-oriented product and market innovation. The study is grounded mainly in the GI and organisational resource development literature, which provides the lens for examining how sustainability is embedded into organisational practices. Resource-Based View (RBV) and particularly dynamic capabilities are considered in the explaining and understanding how organisations adapt and reconfigure their resources (Helfat et al., 2023; Rao et al., 2024).

1.6.2. Physical scope

This study focused on South African organisations that actively embraced sustainability strategies and were committed to GI as part of achieving their environmental objectives. The organisations selected for the study had made formal, public commitments to sustainability, evidenced through corporate communications, annual reports, or sustainability disclosures. These organisations were identified through sustainability aggregator listings, search-engine results and referrals from sustainability experts, which helped confirm their suitability for the study.

Given the emerging nature of GI in both global and South African contexts (Khanra et al., 2022), the research drew on organisations of different sizes and from various industries. The analysis was based on contributions from middle-and senior managers or executives within these organisations, as they were able to provide insight into decision-making, internal capabilities and organisational practices linked to GI. This broader purposive sampling approach was intentional in order to obtain a diverse set of cases which allowed the study to capture varied experiences, practices and challenges related to developing ORs for GI.

The study was limited to a qualitative research design, focusing on organisational perceptions and lived experiences of the participants working for those organisations. This approach enabled the generation of rich, contextual insights (Plakoyiannaki et al., 2019) that contributed to academic understanding and practical discussions on sustainability within the South African business landscape.

1.7. An overview of the research report

This research report comprises of seven chapters as per summary below on Figure 1.

Figure 1: Research report roadmap

Research report roadmap		
1	Introduction	Background, problem, importance
2	Literature review	Theoretical foundation
3	Research questions	Guides the study
4	Research methodology	Design, sampling, data collection
5	Findings	Themes and insights from analysis
6	Discussion	Relates findings to literature and conceptual framework
7	Conclusion	Summary, contribution, recommendations and future research

Source: Aurthor's own

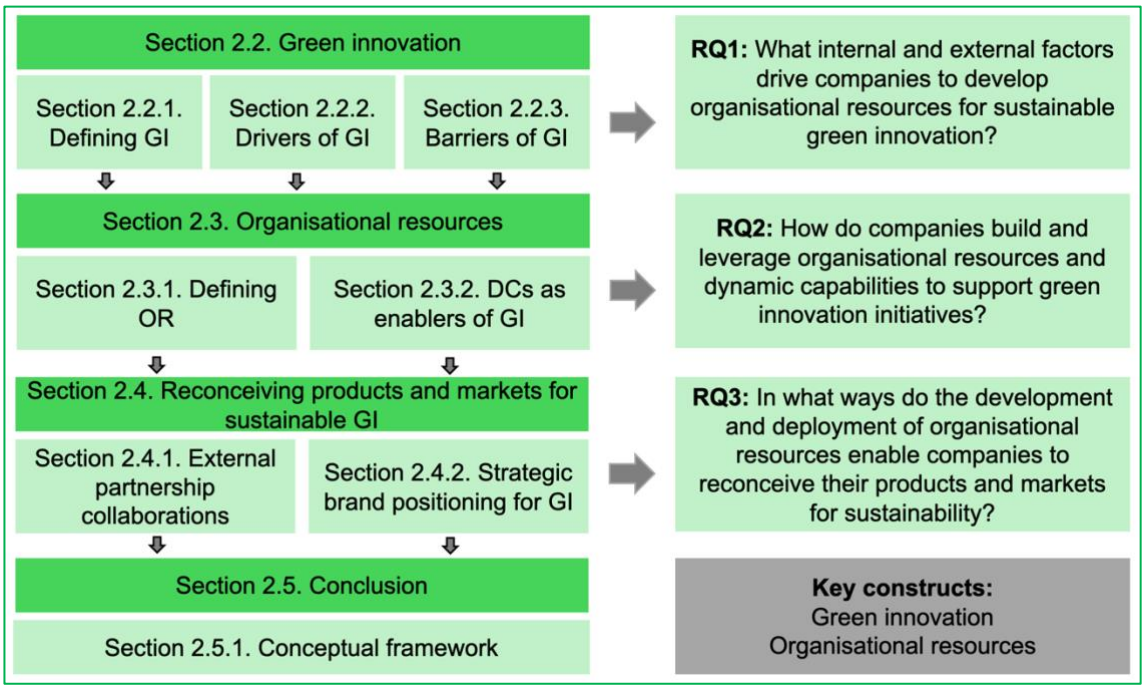
2. Chapter 2: Literature review

2.1. Introduction

This chapter reviews the academic literature that informs this study on how companies develop ORs to reconceive products and markets for sustainable GI. The aim is not only to describe what has been written, but to use the literature to build a clear line of argument that refines the research problem and supports the research questions. The discussion is based mainly on recent peer-reviewed journal articles with most of the articles having a 3- or 4-star rating. Particular attention was given to studies published in the last five years or so. Core contributions such as Khanra et al. (2022) and Xie et al. (2019) serve as key reference points around which the argument is developed.

The literature review roadmap below (Figure 1), provides an overview of how the chapter's sections link to the research questions of the study.

Figure 2: Literature review roadmap



Source: Author's own

The first part of this chapter focuses on GI, defining the concept and examining what drives and constrains it, including stakeholder pressure, leadership commitment, resource constraints and integration challenges.

The chapter then turns to ORs and dynamic capabilities, drawing on the RBV and DCs literature to explain how skills, knowledge, technology and R&D can be configured to support GI. Here, the review looks at employees, knowledge management, technology and R&D as drivers, highlighting both agreement and tension in the literature. This helps position the study within ongoing debates about how resources are combined and reconfigured to create sustainable advantage.

The final part of the chapter examines how organisations reconceive products and markets for sustainable GI. It considers work on collaborative partnerships, knowledge sharing and market shaping, product redesign, brand positioning, and shows how all these link back to the central question of how companies use ORs to respond to and reshape their markets.

Each main section ends with a short conclusion that draws together the evidence and clarifies what it implies for this study. The closing section of the chapter summarises these conclusions to confirm the theoretical relevance of the research questions and to show how they follow from gaps and tensions identified in the literature. In this way, the chapter situates the study within current academic debates and provides the theoretical basis for the empirical work that follows.

2.2. Green innovation

2.2.1. Defining green innovation

Khanra et al. (2022) define GI as the creation of products and processes that are ecofriendly and cause less harm to the environment (in procurement, production, and use, and which can be recycled easily at the end of their lifecycle). Xie et al. (2019) specifically refer to GI as green technology innovation and like Khanra et al. (2022) categorise it into green product and green process innovation, showing that environmentally friendly product innovation requires adjusting and reworking product designs to incorporate more nontoxic or biodegradable materials, which consider the entire product lifecycle. Furthermore, Begum et al. (2022) corroborates this view and emphasises that GI encompasses efforts to minimise environmental burdens through various technological, organisational, and strategic approaches.

The term GI has various alternatives across scholarly literature (Bhatia, 2021), with some scholars referring to “environmental innovation” or “sustainable innovation” or “eco-innovation” (Bhatia, 2021, p. 2846; Bataineh at al., 2023, p. 1007). Given the diversity in terms, this study will adopt a holistic perspective of GI, viewing GI as a strategic integration of tangible solutions and intangible supportive practices, aimed at fostering sustainability and responsible corporate practices (Begum et al., 2022). This approach also highlights the critical need to understand how companies develop the necessary ORs to reconceive products and markets, directly aligning with the RQ and addressing the gap identified by Khanra et al. (2022).

2.2.2. Drivers of green innovation

2.2.2.1. Stakeholder pressure and GI

Consumers are increasingly asking for greener and more responsible options (Xie et al., 2019; Madrid-Guijarro & Duréndez, 2023), and regulators and shareholders (Wiredu et al., 2024) are stepping up too, pushing organisations to not only comply with the regulations but also use natural resources wisely (Bhatia, 2021). Madrid-Guijarro and Duréndez (2023), point out that competitor pressure drives organisations to move towards GI. This happens particularly when organisations seek to avoid falling behind competitors that are already capturing market opportunities through GI strategies that they have not yet adopted (Madrid-Guijarro & Duréndez, 2023). An interesting call out is employee pressure on the organisation to conform towards supporting environmental sustainability as a driver of GI (Madrid-Guijarro & Duréndez, 2023). These overlapping influences from different stakeholders continue to shape environmental and sustainability strategies, pushing organisations to embed sustainable practices across their operations and product development processes (Bataineh et al., 2024; Tuấn, 2022).

Transforming stakeholder pressure into real organisational change and impactful GI relies on practical procedures such as sharing knowledge through the supply chain, investing in R&D, and building strong partnerships with strategic allies (Song et al., 2020; Khanra et al., 2022). However, having access to knowledge and sharing it internally or with partners is not enough. Organisations also need the ability to take in that information and use it effectively. Absorptive capacity (AC) is when an organisation is able to notice useful sustainability-related knowledge from outside the organisation, make sense of it, and then apply it in practice (Song et al., 2020). Song et al. (2020) highlight that AC helps explain how organisations turn shared green knowledge into actual GI outcomes. In other words, it is not just the knowledge itself that matters but the organisation’s ability to

understand and use it (Song et al., 2020). Interestingly, Song et al. (2020) suggest that stakeholder pressure strengthens an organisation's AC. When organisations face increasing pressure from regulators, environmentally conscious customers etc., they may feel the need to fully use the available knowledge towards GI outcomes. (Song et al., 2020). Overall, this means managers should focus on developing the ability to interpret, absorb, and apply sustainability knowledge, rather than accessing it. Doing so increases the chances of turning shared knowledge into meaningful innovation and change.

Economic constraints and day-to-day operational challenges can limit how effectively organisations respond (Xie et al., 2019), particularly when sustainability efforts are viewed as cost centres rather than value drivers. Moreover, while demand for green products is growing, many consumers remain reluctant to absorb higher costs, creating a difficult trade-off between environmental goals and financial realities (Khanra et al., 2022; Xie et al., 2019). This interplay is the reason it is important to develop ORs that can enable organisations to respond appropriately (Khanra et al., 2022). This highlights the significance of internal organisational factors like leadership and R&D, which influence GI outcomes (Bhatia, 2021; Bhatia & Jakhar, 2021; Wiredu et al., 2024).

In conclusion, stakeholder pressure is important in pushing organisations towards GI. Customers, regulators, competitors, shareholders, and even employees shape expectations and encourage organisations to take sustainability seriously (Xie et al., 2019; Madrid-Guijarro & Duréndez, 2023; Bhatia, 2021). However, pressure alone is not enough to create meaningful change (Song et al., 2020). Organisations need the right capabilities to act on this pressure, and this includes being able to understand and apply new sustainability know-how (Song et al., 2020). This highlights the importance of AC, as organisations that can take in and use information are better placed to respond to sustainability demands and turn ideas into real outcomes (Song et al., 2020). At the same time though, financial pressures and operational challenges can slow progress, especially when sustainability is seen only as a cost (Xie et al., 2019). This is why leadership commitment and investment in skills, knowledge, and internal processes remain important (Bhatia, 2021; Bhatia & Jakhar, 2021; Wiredu et al., 2024). These insights show how external pressures shape and make it necessary for organisations to foster the internal resources and capabilities that support GI, directly informing RQ1.

2.2.2.2. Leadership commitment and GI

Leadership commitment is essential for implementing changes in environmental management practices that enhance GI (Bhatia, 2021; Bhatia & Jakhar, 2021; Wiredu et al., 2024). Wiredu et al. (2024) underscore that leaders should be at the forefront of setting sustainability goals for the organisations, by assigning the necessary resources required to advance GI, and ensure sustainability is well integrated within their business practices. Similarly, Wang and Juo (2021) affirm leadership commitment as essential for securing the resources needed to improve green performance, especially given the traditional perception of environmental protection and industrial strategy as a trade-off. Moreover, leadership commitment influences how companies mobilise OR like green knowledge (Sahoo et al., 2022), to reimagine products and access sustainable markets, thus fuelling GI (Begum et al., 2022). Without leadership actively prioritising sustainability and allocating resources accordingly, organisations struggle to shift from traditional practices to truly innovative green solutions (Shehzad et al., 2024).

Interestingly, Bhatia and Jakhar (2021) and Wiredu et al. (2024) add that top management support encourages creative thinking and enhances innovative practices among employees. While Bhatia and Jakhar (2021) focus on how top management's commitment enables organisational learning and a supportive environment for GI, Wiredu et al. (2024) stress the need for robust monitoring and the need to embed sustainability into the business culture through leadership support. Additionally, Madrid-Guijarro and Duréndez (2023) consent that when top management are truly committed, they show it in practical ways, such as recognising the value of sustainable business practices, backing them with clear environmental policies, and investing required resources behind their efforts. These actions help to embed sustainability into the company culture, and have a substantial impact on related to environmental outcomes (Madrid-Guijarro & Duréndez, 2023).

Overall, there is scholarly alignment that leadership commitment is an important component in the success of fostering GI (Bhatia, 2021; Bhatia & Jakhar, 2021; Wang & Juo, 2021; Wiredu et al., 2024). Thus, it can be argued that to create a work setting where employees are free to experiment and reconfigure processes to optimise sustainability outcomes, such as new products, leadership must demonstrate a commitment to and actively support GI initiatives. This kind of commitment is essential as it acts as a bridge to overcome everyday challenges like limited capital investment, time pressures, and gaps in knowledge (Madrid-Guijarro & Duréndez, 2023). This is why leadership commitment is an important consideration in exploring the RQ.

2.2.3. Barriers of green innovation

2.2.3.1. Resource constraints and GI

GI comes with a high price tag (Khan et al., 2021; Khanra et al., 2022; Madrid-Guijarro & Duréndez, 2023). Organisations are often hesitant to invest towards environmental sustainability initiatives because of concerns that they could undermine their competitiveness by driving operational costs up (Khan et al., 2021; Khanra et al., 2022). Given that GI may require updated methods of the production of products, Xie et al. (2019) posit that organisations should invest in new and advanced equipment and technology, which could be expensive. Nonetheless, Xie et al. (2019) further argue that organisations with limited resources could start with green process innovation before moving on to green product innovation because improving processes first can save costs through enhanced efficiencies and build a base for later product-level efforts. Madrid-Guijarro and Duréndez (2023) emphasise that the lack of sustainability know-how by employees impedes GI, while Khanra et al. (2022) highlight that training employees to acquire new knowledge to use these new technologies may also be costly. Similarly, Bataineh et al. (2024) affirm that implementing GI calls for extensive knowledge and abilities that may not be easily accessible within an organisation.

Another resource constraint surfaced by Madrid-Guijarro and Duréndez (2023) is time. This is because implementing GI is not an overnight undertaking, but rather a gradual and often complex process that demands long-term commitment and sustained effort. Thus, many organisations could find it difficult to access the capital for significant upfront costs (Xie et al., 2019) and may hesitate because the return on investment (ROI) is not immediate (Khan et al., 2021; Khanra et al., 2022). This highlights the importance of understanding how organisations use and develop their resources they need to respond to these challenges. According to Sign et al. (2022), organisations can strengthen and adjust their internal capabilities to turn these constraints into opportunities, which could help them overcome financial barriers and make GI a reality. This is why it is useful to unpack how organisations build and use their resources to manage high costs and rethink their products and markets for sustainable GI, which helps explain how organisations can move past financial barriers and make GI a reality (Sign et al., 2022).

In conclusion, GI is challenging because it demands time, financial resources, and new skills (Madrid-Guijarro & Duréndez, 2023; Khanra et al., 2022; Xie et al., 2019). Yet, these barriers also push organisations to rethink how they use their resources. When

organisations view constraints as opportunities to innovate, they can discover more efficient ways to operate and compete (Singh et al., 2022). Strengthening internal capabilities and learning to adapt existing resources are key steps in this process (Madrid-Guijarro & Duréndez, 2023). By improving how they manage knowledge, technology, and investment, organisations can reduce costs and make progress toward sustainability goals (Khan et al., 2021). Overall, while GI can seem costly and complex, developing flexible and resourceful strategies allows organisations to balance financial pressures with long-term environmental responsibility as well as competitiveness (Singh et al., 2022). All this highlights how internal limitations and resource decisions shape an organisation's ability to pursue GI, which directly supports the focus of RQ1.

2.2.3.2. Integration constraints and GI

Khanra et al. (2022) and Bataineh et al. (2024) highlight that successful GI requires strong collaboration across business unit departments (e.g., supply chain, marketing, production). Tuấn (2022) asserts that to boost GI, organisations can look to international guidelines to steer their efforts. However, while these guidelines provide a structured framework of how to integrate various processes to enhance GI, integration may present its own challenges (Tuấn, 2022).

These include aligning different departments (cross-functional collaboration), training employees on new procedures (Khanra et al., 2022), and ensuring compatibility between existing systems (Tuấn, 2022). Khanra et al. (2022) thus point out that silos within organisations make GI implementation fragmented and inefficient, and because integration may require significant time and resources, it can potentially slow down the innovation process (Bataineh et al., 2024). Similarly, Khan et al. (2021) show that integration efforts on their own do not always lead to greener outcomes, suggesting that integration needs to be supported by strong, innovation-oriented collaboration to achieve meaningful environmental improvements. When organisations find it difficult to integrate GI into their processes, this can act as a barrier that slows progress towards GI (Khan et al., 2021). This would hamper effective cross-functional collaboration and effective knowledge assimilation, thus make it harder for GI initiatives to be implemented successfully. Moreover, limited system compatibility may mean people spend more time on processes that machines could do versus on other higher pay-off tasks and activities. All this shows why it is crucial to understand how companies build the right resources and overcome obstacles between teams to reconceive products and markets for GI. This demonstrates that exploring the RQ can reveal what really could help organisations overcome integration challenges and create sustainable changes.

In conclusion, successful GI is influenced by how well organisations can integrate and coordinate their internal functions. As highlighted by Khanra et al. (2022) and Bataineh et al. (2024), effective GI requires strong collaboration across departments such as marketing, supply chain, and production. Tuấn (2022) further notes that international guidelines can provide a useful roadmap for integrating these functions. However, integration is not without its challenges. Organisations must overcome barriers such as departmental silos, inadequate employee training, and system incompatibilities. These issues can fragment GI efforts and slow innovation progress. Moreover, as Khan et al. (2021) explain, integration alone is not enough unless supported by collaboration that promotes innovation and environmental improvement. When integration barriers persist, they can hinder knowledge sharing and resource alignment, which make it harder to achieve GI. Therefore, exploring how organisations develop the necessary resources and collaborative capabilities is important for understanding how they can overcome integration challenges and create lasting, sustainable transformation. These challenges show how internal organisational factors can either strengthen or weaken the foundations needed for GI. This directly informs RQ1 by highlighting how internal dynamics influence the development of resources for GI.

2.3. Organisational resources

2.3.1. Defining organisational resources

2.3.1.1. The role of organisational resources in GI

Organisations consist of various resources such as skills, knowledge and technology which function optimally when they operate together (Barney et al., 2021). When resources work well together, they create more value because they enable product improvements products and cost reductions, which make them strategic (Rao et al., 2024). Strategic resources form part of an organisation's foundation because they help business create economic value (Barney et al., 2021; Helfat et al., 2023; Rao et al., 2024). Also, understanding which of the resources are unique or combinations are useful is equally important (Barney et al., 2021; Rao et al., 2024). This can help organisations reproduce results that are economically beneficial (Barney et al., 2021), particularly if the combinations of the resources result in increased organisational performance.

2.3.1.2. Resource-based view: Understanding strategic value

The Resource-based view (RBV) provides a strategic framework for making sense of how organisations achieve sustained superior performance through the ownership and

deployment of “valuable, rare, inimitable, and non-substitutable (VRIN) resources” (Helfat et al., 2023, p. 1362; Furr & Eisenhardt, 2021). These resources extend beyond physical assets to include knowledge, capabilities, culture, and intellectual property (Barney, 2021; Helfat et al., 2023). To achieve a sustained competitive advantage, organisations should acquire, develop, and adapt VRIN resources to maximise value with their target markets (Barney et al., 2021; Furr & Eisenhardt, 2021; Helfat et al., 2023). Helfat et al. (2023) suggest that RBV should be updated to include digital transformation, stakeholder influence, and dynamic environments, which means that organisations need to adapt and reconfigure resources for relevance and long-term success (Rao et al., 2024).

2.3.1.3. Dynamic capabilities: Adapting for sustained competitive advantage

Dynamic capabilities (DC) is when an organisation is able to “sense, seize and continuously reconfigure their capabilities” to adapt to change (Barney, 2021; Çavuşgil & Deligonul, 2024, p. 34; Rao et al., 2024). Sensing involves identifying and evaluating opportunities or threats, requiring planning and preparation (Çavuşgil & Deligonul, 2024; Rao et al., 2024). Seizing is when an organisation is able and equipped to deploy resources to address opportunities or respond to threats, focusing on adaptability (Çavuşgil & Deligonul, 2024; Rao et al., 2024). Reconfiguration as Rao et al. (2024) and Barney et al. (2021) point out, is about renewing resources and transforming organisational structures to benefit from opportunities. These processes enable organisations to refresh their resources and continue to sustain their competitive advantage (Furr & Eisenhardt, 2021).

Tuấn (2022) highlights that DC enable organisations to stay alert to shifts in their external environment - like new environmental regulations or growing consumer interest in green products. Essentially, having an impact on how organisations bring together, develop, and update resources and skills because of environmental challenges and emerging opportunities (Singh et al., 2021). Wang and Juo (2021) suggest that DC allow organisations to seize opportunities by developing innovative green products, services, and processes. Furthermore, Sahoo et al. (2022) suggest that DC are important for the advancement of green knowledge management and facilitating innovations in relation to green technology - both of which are important for improving environmental performance.

Organisations that have DCs that are well-developed have an increased ability to gather, understand, and use green knowledge effectively, helping them to roll out environmentally friendly technologies and practices effectively (Çavuşgil & Deligonul, 2024; Wang & Juo, 2021). These organisations often see improved environmental

performance and reduced costs (Wang & Juo, 2021). As a result, they are not only better positioned to reduce their environmental impact but also meet customer demands for green products, which can help build a stronger market position, further supporting their broader sustainability goals (Singh et al., 2021; Tuấn, 2022). This position may place them in a better standing to enter or create new markets. Drawing on RBV, it can be suggested that VRIN become DCs when reconfigured, helping organisations take advantage of opportunities or counter threats (Helfat et al., 2023). This can offer increased understanding in how do companies reconceive products and markets to drive sustainable GI. These ideas show that DCs help organisations stay alert, make decisions, and reshape their resources as conditions change. In practice, this is how companies turn their existing skills and assets into something that can genuinely support GI. This speaks directly to RQ2, because it explains the processes through which organisations build and use resources as capabilities to carry their GI efforts forward.

2.3.2. Dynamic capabilities as enablers of GI

2.3.2.1. Employee capability and GI

For organisations to keep staying ahead of its competitors through the pursuit of GI goals, they must build and maintain the capacity to identify opportunities, act decisively, and adapt quickly (Aftab et al., 2022; Tuấn, 2022; Wang & Juo, 2021). In this pursuit, Wang and Juo (2021) posit that the success of an organisation's GI initiatives are significantly dependant on the skills and commitment of its workforce. Which is why organisations must increase green skills in order to pursue environmental objectives (Aftab et al., 2022; Madrid-Guijarro & Duréndez, 2023). This can be influenced by adopting a "green human resource management" (Aftab et al., 2022, p. 1782) approach. This approach incorporates eco-friendly objectives into HR practices that include recruiting, training, and employee recognition (Aftab et al., 2022). Furthermore, employees with environmental consciousness, have green skills and are willing to engage in green initiatives are critical for an organisation's GI success (Aftab et al., 2022; Wang & Juo, 2021). It is equally important for organisations to furnish their workforce with the tools, support, and incentives to contribute to the long-term environmental objectives of an organisation (Aftab et al., 2022). According to Wang and Juo (2022) this is signified as investing in building employee capability.

Building such capability also strengthens what is known as green human capital (GHC), which is an employees' knowledge, skills, and commitment about the environment (Wang & Juo, 2022). GHC forms part of an organisation's broader green intellectual capital and helps link employee expertise to GI efforts. When organisations have superior

levels of GHC, they are in a better position to design and apply green processes and products, which improves both innovation and performance (Wang & Juo, 2022). This shows that developing employee's green skills and awareness is not only about training but also about building a strong base for continuous, organisation-wide innovation.

Tuấn (2022) suggest that DCs rely on employee capability, particularly their creativity. Employee creativity is thus critical for success of GI because it signifies the ability of an organisation to evolve as a result of changing environmental conditions. Organisations that demonstrate strategic proactiveness, risk-taking, and innovative approaches toward environmental initiatives are more successful in developing new eco-friendly products (Tuấn, 2022). To get the most out of their people, organisations need to create the right conditions, which include setting up structures that enable employees to apply their skills effectively and allocating resources for environmental initiatives, and encouraging a culture of innovation (Aftab et al., 2022; Tuấn, 2022). This reveals that employees who have the right support through organisational structures and systems are more likely to deliver impactful solutions and help the organisation adapt quickly to shifting market dynamics – useful in product development.

In summary, employees play a central role in how organisations achieve their GI goals. Building green skills and capabilities allows organisations to meet environmental objectives while staying competitive (Aftab et al., 2022; Wang & Juo, 2021). Strengthening GHC links employee knowledge and commitment directly to innovation outcomes (Wang & Juo, 2022). Creative and capable employees also help organisations adapt more easily to environmental change; this shows that dynamic capabilities depend on people and their ability to innovate (Tuấn, 2022). So then, environment-focussed human resource approaches that focus on training, support, and recognition are critical for developing this potential (Aftab et al., 2022). When organisations invest in people through skills, knowledge, and opportunities for creativity, they help create the foundation for sustainable innovation as well as long-term organisational success (Tuấn, 2022; Madrid-Guijarro & Duréndez, 2023).

2.3.2.2. Technology and knowledge management and GI

Organisations who want to optimise GI to help achieve sustainability goals, must learn how to effectively gather, process, and use environmental knowledge (Sahoo et al., 2022; Shahzad et al., 2021). Sahoo et al. (2022) highlight that advanced analytics plays an important part in this process by giving organisations the ability to handle complex environmental data and translate it into actionable insights.

Sahoo et al. (2022) underscore that acquiring green knowledge coupled with big data analytics function as a core capability makes GI possible. This allows organisations to not only acquire information but also convert complex environmental data into valuable resources for strategic decision-making which impact aspects like procurement, product design and production including distribution (Dahlquist, 2021; Sahoo et al., 2022; Shahzad et al., 2021). Sahoo et al. (2022) further suggest that effective green knowledge systems can enhance environmental outcomes by minimising waste, cutting emissions, and improving the way resources are used. Interestingly, Appiah and Essuman (2024) assert that organisations with innovation orientation (IO) support the development of knowledge structures that enable them to explore and exploit opportunities for green product development, a part of GI. However, organisations must also manage knowledge redundancy carefully, as overlapping systems or duplicated information can weaken efficiency (Dahlquist, 2021).

For these initiatives to succeed, there is heavy reliance on management's resource support through sufficient financial and technological investments (Sahoo et al., 2022; Shahzad et al., 2021). It is equally important for cross-functional alignment throughout the organisations to ensure resource effectiveness, Dahlquist (2021), calls out strong alignment between supply chain and marketing especially.

Sahoo et al. (2022) and Shahzad et al. (2021) assert that the effective incorporation of knowledge management with technological capabilities leads to unique competitive advantages that make replication by competitors difficult to achieve. This collaboration between technological infrastructure and knowledge assets enables organisations to develop innovative environmental solutions and accumulate valuable intellectual property (Sahoo et al., 2022). Managing knowledge flows across functions such as marketing, product development, and supply chain also helps organisations adapt quickly to market and environmental changes (Dahlquist, 2021). This integration between technological infrastructure and knowledge assets, Shahzad et al. (2021) point out, is important because it enables organisations develop innovative environmental solutions and accumulate valuable intellectual property (Sahoo et al., 2022).

In conclusion, research highlights that effective GI is influenced by how well organisations gather, share, and apply environmental knowledge. When knowledge management and technology work together, organisations are better able to turn information into innovation that supports both environmental and business goals (Sahoo

et al., 2022; Shahzad et al., 2021). Advanced analytics, reliable data systems, and leadership support are all important for this to succeed. However, Dahlquist (2021) notes that issues such as knowledge duplication, weak coordination, and uneven resource allocation can limit progress. Integrating knowledge systems across departments helps overcome these barriers by improving collaboration and responsiveness. Managing environmental knowledge effectively provides the foundation for continuous sustainable innovation and competitive advantage (Appiah & Essuman, 2024; Sahoo et al., 2022). Overall, technology and knowledge systems work hand in hand to help organisations turn environmental information into useful action. When these systems are aligned, organisations are better able to build the internal capabilities needed to support GI. It connects with RQ2 by revealing how these systems strengthen the capabilities needed to deliver meaningful GI outcomes.

2.3.2.3. Research and development and GI

Bataineh et al. (2024) and Khanra et al. (2022) agree that R&D is necessary for GI because it allows the development of new eco-friendly technologies and products. R&D investment is a key driver of GI which enables organisations to adopt new processes and technologies needed to tackle environmental challenges while staying competitive (Zhang & Jin 2021). However, the Bhatia (2021) posits that success of these efforts often depends on how proactive an organisation's strategy is. For instance, when top management prioritises environmental goals beyond legal compliance, R&D investment is more likely to be much more effective (Bhatia, 2021). In those instances, as Khanra et al. (2022) proposes, investing in R&D not only encourages GI but it also reinforces how green practices can boost an organisation's competitive advantage.

Moreover, Bataineh et al. (2024) assert that it is necessary for organisations to invest in R&D in order to strengthen technological capabilities and develop solutions that are innovative to help minimise of solve environmental issues. Khanra et al. (2022) indicate that GI enables organisations to decrease manufacturing expenses while improving environmental standards and fulfilling regulatory requirements. The implementation of GI in business operations enables organisations to reach goals that exceed regulatory requirements while simultaneously boosting production efficiency and effectiveness and improving brand reputation and market reach to enhance their competitive advantage (Bataineh et al., 2024).

Zhang and Jin (2021) argue that sustained R&D investment in GI enables organisations to strengthen innovation performance and resilience, supporting long-term

organisational success beyond immediate profitability. But this improvement does not happen automatically. Bataineh et al. (2024) and Khanra et al. (2022) assert that R&D creates value mainly by building important internal capabilities, such as technological know-how and organisational learning. This allows GI to succeed. Bhatia (2021) notes that these capabilities act as bridges between R&D and the actual results, like increased efficiency, reduced waste, and stronger adaptability. In this way, R&D becomes the foundation for developing the internal strength that organisations need to make GI work in practice (Bataineh et al., 2024). That is part of the reason why Khanra et al. (2022) encourages organisations to invest in R&D for the success of GI.

To maximise the impact of GI, organisations should also actively seek and integrate external knowledge (Awan et al., 2021; Khanra et al., 2022). In this way, R&D helps organisations develop “higher-order” resources needed to stay ahead (Khanra et al., 2022, p. 1396). That said, at the product level, it cannot be considered the silver bullet as it may not necessarily result in immediate gains, mainly because it often requires sustained investment over time. Interestingly, Bhatia (2021) asserts that green product and process innovation follow different paths. Awan et al. (2021) extends that external knowledge, such as ideas shared by buyers or partners, affects green product innovation more strongly, while process innovation depends more on internal investment in environmental management and employee training. Bataineh et al. (2024) further offers that understanding these different paths can help organisations align their R&D focus more effectively with their GI goals. This is why Khanra et al. (2022) advocate for R&D to be viewed more holistically at the organisational level rather than being limited to individual products, but also proposes further research about how GI can be used to reconceive products and markets and still be profitable at that level.

In summary, R&D plays an important role in driving GI and supporting organisational competitiveness. As shown by Bataineh et al. (2024) and Khanra et al. (2022), investment in R&D enables organisations to design green products and processes while improving efficiency. However, this link is shaped by strategic and contextual factors. Bhatia (2021) stresses that proactive environmental strategies make R&D investment more effective, while Zhang and Jin (2021) note that long-term success depends on building internal capabilities rather than short-term returns. Awan et al. (2021) and Khanra et al. (2022) further show that external knowledge strengthens these efforts, creating higher-order resources for sustainable organisational performance. All this suggests that R&D should be understood as a continuous, organisation-wide commitment that connects strategy, learning, and collaboration to achieve meaningful

GI outcomes. This connects to RQ2, which examines how these capabilities are developed and applied in practice.

2.4. Reconceiving products and markets for sustainable GI

Organisations use strategic resources to re-conceive both their products and the markets they target. This means redesigning products with sustainability in mind, for example, choosing biodegradable materials, adopting cleaner production methods, and creating products with longer or circular lifecycles (Khanra et al., 2022; Xie et al., 2019). Such redesign efforts are often supported by internal innovation systems and R&D investments, which enable organisations to embed eco-efficiency into core offerings and differentiate themselves in competitive markets (Bataineh et al., 2024).

Market orientation strategies can help organisations understand changing customer requirements for green products and place their offerings in a desirable way (Bhatia, 2021). Market sensing is often backed up by data-driven insights, particularly in digitally enabled environments where organisations use analytics and digital platforms to respond to shifting sustainability preferences (Varadarajan et al., 2022). In these cases, digital product innovations help organisations meet environmental targets and achieve social objectives through accessible, affordable and inclusive market offers (Varadarajan et al., 2022). Such collaborations help companies share knowledge quickly and implement best practices, allowing them to innovate, waste reduction and meet regulatory and consumer expectations (Awan et al., 2021; Du et al., 2022). Cooper (2021) asserts that innovation efforts frequently come to a standstill when there are too many under-resourced projects that water down focus. High-performing organisations prevent this by managing limited portfolios and using specialised teams to expedite development (Cooper, 2021). Lean development practices together with stage-gate systems that incorporate agile methods decrease waste and speed up decision making while enhancing process flexibility (Cooper, 2021). These process innovations allow sustainability considerations to be integrated at an earlier and more effective stage in product development, helping organisations to meet environmental targets while maintaining their competitive tempo (Cooper, 2021).

The development of strategic resources allows organisations to both respond to current stakeholder expectations and disrupt and create markets by introducing innovative green products and services that drive sustainability (Begum et al., 2022; Khanra et al., 2022). Organisational levers that support in reconceiving both product and market boundaries

for sustainable competitive advantage include R&D intensity, digital capability, and innovation process agility, backed by collaboration and market responsiveness (Bataineh et al., 2024; Cooper, 2021; Varadarajan et al., 2022).

Organisations which properly implement green knowledge management systems achieve substantial enhancements in their environmental performance by reducing waste and emissions and improving resource usage (Sahoo et al., 2022). For example, managing knowledge flows in marketing (customer relationships, product development and supply chain management) can enable organisations to move quickly to adapt to rapid changes (Dahlquist, 2021). A well-executed integration between these aspects creates both sustainability gains and lasting competitive advantages (Sahoo et al., 2022; Shahzad et al., 2021). Essentially, businesses that put these systems in place can respond quickly to develop distinctive solutions for complex environmental issues which generates competitive benefits (Dahlquist, 2021; Sahoo et al., 2022).

To conclude, collaboration has an important role in helping organisations develop GI capabilities. Working together allows organisations to share knowledge, jointly solve problems, and learn from each other in ways that support better sustainability outcomes (Awan et al., 2021; Du et al., 2022; Khan et al., 2023). These collaborative partnerships can improve overall performance, strengthen supply chains, as well as improve competitiveness for all the partners involved. Nonetheless, collaboration needs to be managed carefully. Partners need to be aligned in their goals and values, and they need to understand where the limits of collaboration should be to avoid unproductive outcomes (Baker & Nenonen, 2020; Du et al., 2022).

2.4.1. External partnership collaborations

Organisations can improve GI through strategic partnerships that facilitate knowledge exchange and co-creation (Awan et al., 2021; Du et al., 2022). According to Khan et al. (2023) success relies on the organisations' ability to implement these capabilities effectively. This aligns with the idea around collective market work (Baker & Nenonen, 2020), where “orchestrated strategies” (p. 249) and deliberate actions by collaborating different “market actors” (p. 240) shape market rules as well as practices. For example, in buyer-driven supply chains, manufacturers who participate in knowledge transfer with buyers can gain valuable insights into production methods and customer requirements through their network of partnerships (Awan et al., 2021). Organisations must develop

capabilities which give them the ability to detect as well as utilise internal and external resources (Khan et al., 2023).

Khan et al. (2023) emphasise that supply chain partners must join forces and work together to establish a unified supply chain system which combines competitiveness with transparency. However, organisations must be strategic about who they collaborate with, ensuring similar size, values, and business objectives to avoid undermining the collective's market work (Baker & Nenonen, 2020). Du et al. (2022) caution that too much collaboration can backfire by producing unfavourable results, because partnerships still need clear limits and structure. Khan et al. (2023) also note that green purchasing efforts often struggle when they are not well connected to wider supply chain collaboration and knowledge-sharing networks, which are essential for moving sustainable practices forward. When these connections are in place, buyers and manufacturers are better able to solve problems together, because they have a common understanding of the goals and processes involved (Awan et al., 2021; Du et al., 2022). Khan et al. (2023) propose that the collaboration must include suppliers together with consumers and regulatory elements as part of an extended industrial framework. Organisations that participate in operational consulting and joint technology development are in a better position to achieve superior GI outputs (Awan et al., 2021; Du et al., 2022; Khan et al., 2023).

Beyond establishing these collaborative foundations, organisations can use “market shaping” strategies to transform entire market systems (Nenonen et al., 2020, p.236). Market shaping is about the deliberate actions that organisations and other actors take to influence the structure, behaviour, and norms of a market (Nenonen et al., 2020). The shaping of markets is done through the choices and behaviours of the actors operating within them (Nenonen & Storbacka, 2020). Market shaping involves actors who deliberately modify market features through three methods: redesigning exchange content and reorganising stakeholder networks and reshaping market institutions that control all stakeholder conduct (Nenonen et al., 2020). Market shaping extends beyond market adaptation because it requires organisations to actively design or transform market characteristics to align their desired vision (Nenonen & Storbacka, 2020). This strategic approach enables organisations to expand their collaborative capabilities for broader market transformation.

To succeed at shaping a market, organisations need to create solutions that benefit multiple stakeholders (Baker & Nenonen, 2020; Nenonen & Storbacka, 2020). This means looking beyond the organisation’s immediate relationships and working to change

the whole system (Nenonen & Storbacka, 2020). Interestingly, Song et al. (2020) build on market shaping principles by highlighting that collaboration is not only strategic but also a practical route to absorbing new knowledge that supports innovation. Organisations improve their GI when they engage with external stakeholders and share green knowledge across their networks (Song et al., 2020). Essentially, instead of reacting to the market, organisations can proactively create a better one for all stakeholders (Baker & Nenonen, 2020; Nenonen et al., 2019; Nenonen & Storbacka, 2020).

While market shaping's transformative potential is clear, there are differing views on how organisations should approach resilience within market shaping strategies, particularly regarding timing and collaboration. Nenonen and Storbacka (2020) emphasise using crises to create market malleability, and advocate for organisations to actively shape markets rather than simply adapt to them, even in the face of not being the actor with the vision, they propose to be a supporting actor. According to Nenonen and Storbacka (2020) this is because market shaping is about deliberately changing the structures of the market, the various practices involved as well as the agendas encompassed within that particular market. Meanwhile, Beninger and Francis (2021) focus on competitors' collective market shaping through resilience work, which is essentially the coordinated effort to keep the market stable and preserve existing structures. Beninger and Francis (2021) argue that market shaping is not always about disruption but can involve defending the current market system, especially when organisations share an interest in maintaining predictability or protecting vulnerable sectors.

Song et al. (2020) offer a useful bridge between these views by suggesting that stakeholder pressure and green knowledge sharing can strengthen an organisation’s AC, making it easier to innovate even in uncertain or challenging conditions. This supports the emphasis by Nenonen and Storbacka (2020) about acting during disruption, while also recognising that organisations rely on stable, long-term relationships to build the knowledge needed for innovation. In this sense, Song et al. (2020) complement Beninger and Francis (2021) by showing that collaboration not only preserves resilience but actively enhances the organisation’s ability to innovate within that stable environment. This highlights the strategic tensions organisations must navigate when shaping markets for GI.

This tension reveals that organisations developing ORs for GI face a fundamental resource architecture decision in that they must choose whether to build capabilities for

exploiting market disruption or collaborative market maintenance (Beninger & Francis, 2021; Nenonen & Storbacka, 2020). This choice not only shapes what ORs are developed but how they are deploy when reconceiving products and markets for sustainability. Song et al. (2020) reinforce the importance of the collaborative side of this choice by showing that green knowledge sharing with partners strengthens an organisation's AC further giving it the ability to use the new environmental knowledge. This suggests that collaboration is not only a relational activity but a capability-building mechanism that supports more sustained forms of market shaping (Baker & Nenonen, 2020; Song et al., 2020). Could it be though, that there is a space for organisations to develop hybrid approaches: building collaborative networks during stability while maintaining capabilities to exploit disruption windows for transformation towards GI (Nenonen & Storbacka, 2020)?

To conclude, organisations strengthen their GI when they build strong partnerships, share knowledge and work closely with others across their supply chains (Awan et al., 2021; Du et al., 2022; Khan et al., 2023). Working together helps teams solve problems, develop new technologies and build the expertise needed to help use both internal and external resources effectively (Khan et al., 2023). Beyond single partnerships, organisations can also shape markets by working with other actors to influence market rules, norms and networks (Nenonen et al., 2020; Baker & Nenonen, 2020). Market shaping builds on collaboration by showing how organisations can go beyond adapting to the market and actively work to influence it. This includes changing market rules, and relationships to support wider sustainability goals (Nenonen et al., 2020). In practice, collaboration supports internal capability-building, while market shaping creates the external conditions that can help sustainability efforts towards reconceiving products and markets for GI succeed. Although some scholars emphasise disruption and others on keeping markets stable (Beninger & Francis, 2021), both perspectives show that collaboration and green knowledge sharing are key to creating strong and lasting GI (Song et al., 2020).

2.4.2. Strategic brand positioning for GI

Appiah and Essuman (2024) highlight one of the ways in which an organisation can meet its environmental goals, is by using green product innovation. This, as Qiu et al. (2020) agree, can be achieved by creating better products in terms of design, quality, and dependability. By extension, this can help organisations reimagine products, and thus potentially help in capturing more market share (Qiu et al., 2020) or even breaking into

a new market through the reimagined products because of GI, when organisations embody IO. This becomes even more useful in fast-changing markets where customer preferences shift quickly, giving organisations a chance to stand out by offering greener product options (Qiu et al., 2020). The ability to launch superior green products helps organisations stay competitive and build a stronger position in the market, which Khanra et al. (2021) suggest can improve how customers feel about the organisation and strengthen its overall brand. Similarly, Xie et al. (2019) posit that green product and green process innovation contribute towards improving the financial performance of an organisation. While these market benefits highlight the value of green products, they rely heavily on strong internal foundations that enable organisations to produce credible and genuinely sustainable offerings.

Appiah and Essuman (2024) posit that in order for organisations to address environmental concerns holistically, they must fundamentally reimagine their product development approaches. GI involves creating products that keep environmental impact to a minimum across their entire lifecycle, incorporating non-polluting materials, and returnable packaging systems (Qiu et al., 2020; Appiah & Essuman, 2024). Doing this well depends on having strong internal systems that support sustainability work. Shahzad et al. (2021) suggest that organisations with superior environmental practices are more likely to deliver successful green products. This also shows that green products need to be supported by improved internal processes, so that whatever is claimed about the product is backed up by how the organisation operates (Xie et al., 2019). Beyond improving products and internal processes, organisations must also rethink how these green products are introduced and positioned in the market. Organisations must develop portfolios of complementary resources rather than focusing on individual capabilities in isolation. For example, Appiah and Essuman (2024) show that green product innovation and green marketing work best when they are developed together. Organisations perform better when they have both strong products and clear, consistent communication. This is because marketing alone cannot fix a weak product, and good products will struggle if they are not positioned well (Xie et al., 2019).

Equally important is the market reconception dimension, where Appiah and Essuman (2024) reveal significant contextual dependencies in GI strategies. For instance, in developing countries, where consumer environmental awareness is limited, organisations must fundamentally shift from traditional product-push marketing to education-intensive strategies (Appiah & Essuman, 2024). The concept of green marketing innovation emerges as a critical market reconception strategy, involving the

development of novel marketing approaches that promote environmentally sustainable products through consumer education, creation of green communities, and understanding of consumer diversity (Appiah & Essuman, 2024). This goes beyond traditional marketing by requiring organisations to become educators and community builders, fundamentally reconceptualising their relationship with markets and customers (Appiah & Essuman, 2024). This educational role helps close the gap between what organisations offer and what customers actually understand about green products (Appiah & Essuman, 2024), which is important in markets where people may not yet fully appreciate green products or want to pay more for them (Appiah & Essuman, 2024). However, for this approach to work, organisations need strong internal skills and knowledge-sharing systems so that employees are able to communicate clearly about green products (Shahzad et al., 2021).

Negi et al. (2023) also argue that before organisations can teach or influence the market, they need to build strong environmental values and skills inside the organisation. This includes training employees, developing leaders who champion sustainability and raising general environmental awareness. Getting this internal alignment right is essential, because it boosts performance by strengthening the organisation's ability to innovate in more sustainable ways (Negi et al., 2023). As organisations deepen product development and market education efforts, the question becomes how these activities translate into economic and competitive advantage.

The ability of an organisation to extract economic value from GIs depends heavily on their capacity to align green products with market requirements through innovative marketing approaches (Appiah & Essuman, 2024). This suggests that market reconception involves not only understanding existing market dynamics but actively reshaping market perceptions and preferences through strategic communication and engagement initiatives (Appiah & Essuman, 2024). This means organisations sometimes need to actively guide how customers think about green products, rather than simply responding to what customers already believe. Interestingly, Negi et al. (2023) suggest that organisations can achieve immediate performance gains through practical, operationally-focused green marketing tactics, even before developing the deeper strategic positioning. However, this tactical advantage may be limited because longer term benefits can only be sustained when organisations create and integrate GI within operations (Negi et al., 2023), beyond short objective setting. An important part of this strategic alignment is how customers perceive an organisation's environmental commitment.

A key part of aligning green products with market expectations is how customers view the organisation's environmental commitment. Xie et al. (2019, p. 698) refer to this as an organisation's "green image," which can be described as the perceptions customers hold about how genuinely the organisation behaves toward the environment. This green image contributes in shaping financial outcomes. Xie et al. (2019) show that green product innovation has a much more favourable effect on financial outcomes when an organisation already has a good green image. A strong green image builds customer trust and loyalty, which is necessary to fully realise the financial value of green products (Xie et al., 2019). Similarly, Szabo and Webster (2021) also emphasise how customer perceptions shape the success of green initiatives. However, while Xie et al. (2019) highlight the positive side, that trust and credibility amplify financial returns, Szabo and Webster (2021) point to the risks, showing that perceived greenwashing can weaken environmental and product perceptions and undermine brand credibility. In contrast to the assumption of Xie et al. (2019), that organisations may already have or can build a credible green image, Szabo and Webster (2021) suggest that customers are often sceptical, especially those with strong environmental beliefs, making them more likely to detect signs of greenwashing. Green product innovation and rethinking markets work hand in hand to help organisations rethink what they offer and how they reach customers. Green product innovation allows organisations to redesign products so they have a lower environmental impact without compromising their quality and performance (Qiu et al., 2020; Appiah & Essuman, 2024).

Alongside this, the literature highlights the importance of rethinking markets. In contexts where customer awareness is limited, green marketing innovation becomes essential for helping consumers understand the value of green products (Appiah & Essuman, 2024). Organisations need to educate customers and communicate clearly so that customers can interpret green product benefits meaningfully. Trust has a strong influence on financial outcomes, because green product innovation performs better when customers believe in an organisation's environmental commitment (Xie et al., 2019). These ideas suggest that organisations achieve stronger and more consistent results when green product innovation, internal capability-building, and strategic communication are developed in a connected and mutually reinforcing way (Appiah & Essuman, 2024; Xie et al., 2019). These insights show how organisations not only redesign products but also rethink how they engage with their markets through education, communication, and credibility-building. This combination of green product innovation, internal capability development, and market reconception directly informs how organisations can

reconceive both their offerings and their market positioning for sustainability. In this way, the discussion offers clear grounding for RQ3, which examines how organisations use their resources and capabilities to reshape products and markets through GI.

2.5. Conclusion

The literature shows that GI is both a response to external pressure and a result of internal strategic choices. Stakeholders such as customers, regulators, competitors, shareholders and employees increasingly expect organisations to act responsibly (Xie et al., 2019; Madrid-Guijarro & Duréndez, 2023; Bhatia, 2021). At the same time, financial constraints, skills gaps and integration challenges make it difficult to respond in a consistent way (Khanra et al., 2022; Khan et al., 2021; Bataineh et al., 2024). This tension confirms the relevance of RQ1 by showing that drivers and barriers work together to shape whether and how organisations build resources for GI, rather than operating in isolation.

The review also highlights that ORs as DCs are central to turning intention into action. RBV and DC perspectives point to how important valuable and reconfigurable resources, including skills, knowledge, technology and culture (Barney et al., 2021; Helfat et al., 2023; Çavuşgil & Deligonul, 2024). Studies show how employee capability, GHC, knowledge management systems, analytics and R&D investment help organisations gather, interpret and apply environmental knowledge (Aftab et al., 2022; Wang & Juo, 2021; Sahoo et al., 2022; Bataineh et al., 2024). These insights directly support RQ2, which asks how such resources and capabilities are built and deployed to support GI in practice.

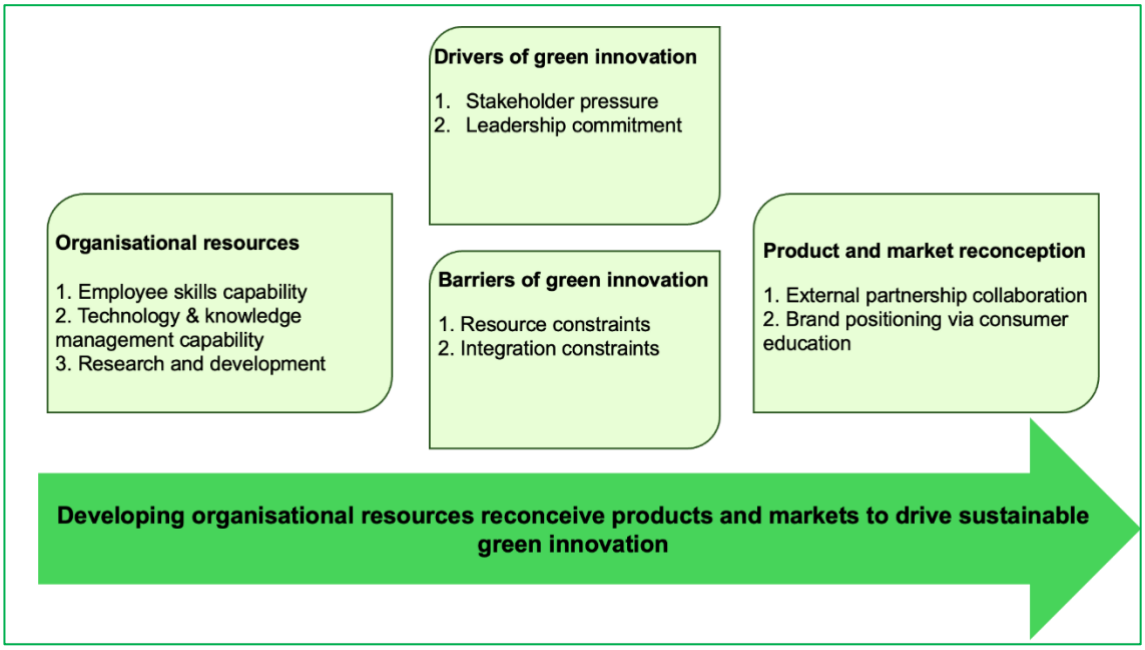
Finally, green product and process innovation can improve environmental and financial performance (Xie et al., 2019; Qiu et al., 2020; Appiah & Essuman, 2024), but their impact depends on how organisations position these offerings, work with partners and shape market expectations. Collaboration, supply chain partnerships and market shaping activities allow organisations to influence market rules, norms and narratives (Awan et al., 2021; Baker & Nenonen, 2020; Nenonen et al., 2020). At the same time, green marketing innovation, green image and the likelihood of perceived greenwashing highlight how credibility and education in market engagement are important (Szabo & Webster, 2021; Negi et al., 2023). These debates frame RQ3 by showing that the

development and use of ORs are closely tied to how organisations reconceive their products and markets for sustainability.

2.5.1. Conceptual map

The conceptual framework below (Figure 3) visually integrates the main themes of the literature review. It shows how the drivers and barriers of GI shape the development of key ORs, and how these resources enable organisations to reconceive products and markets for sustainability. The framework highlights the base argument emerging from the literature: organisations strengthen GI by building capabilities that allow them to respond to external pressures, overcome internal constraints, and transform both what they offer and how they compete. This model guides the empirical exploration that follows.

Figure 3: Conceptual framework for literature review



Source: Author's own

3. Chapter 3: Research questions

Integrating environmental goals and objectives within broader organisational strategies is still a substantial challenge for many organisations, particularly regarding the embedding of sustainability principles in practical, actionable ways (Khanra et al., 2022; Wang & Juo, 2021; Xie et al., 2019). Notably, organisations often lack clarity on how to exploit and develop their ORs to achieve superior sustainability outcomes, especially when aiming to reconceive products and markets for GI (Wang & Juo, 2021). This points to a persistent gap and limited clarity in understanding how organisations can effectively operationalise sustainability ambitions through internal resource mobilisation and capability-building (Khanra et al., 2022; Xie et al., 2019).

The main RQ is how do companies develop ORs to reconceive products and markets to drive sustainable GI? To address this overarching question and the limitations identified in current literature, the study is guided by three sub-questions, each grounded in themes from the literature and reflecting ongoing gaps in empirical understanding (Bhatia, 2021; Khanra et al., 2022; Xie & Zhu, 2020):

1. **What internal and external factors drive companies to develop organisational resources for sustainable green innovation?**
   While other scholars have explored the importance of leadership, demands by stakeholders, and regulatory drivers, there remains limited understanding of the full spectrum of internal and external influences that motivate organisations to commit resources to GI and sustainability practices (Xie et al., 2019; Wang & Juo, 2021).
2. **How do companies build and leverage organisational resources and dynamic capabilities to support green innovation initiatives?**
   Although the RBV and DC frameworks highlight the critical role of internal competencies, specific organisational processes and mechanisms for building and using these resources in the context of GI are not well established in current literature (Bhatia, 2021; Khanra et al., 2022).
3. **In what ways do the development and deployment of organisational resources enable companies to reconceive their products and markets for sustainability?**
   There is a notable gap concerning how resource development translates into tangible product and market innovation aimed at sustainability, and how organisations effectively reposition themselves in response to environmental imperatives (Khanra et al., 2022; Xie & Zhu, 2020).

4. Chapter 4: Research methodology and design

4.1. Research philosophy and assumptions

This study was an exploratory inquiry investigating - how do companies develop ORs for reconceiving products and markets to drive sustainable GI (Khanra et al., 2022). Saunders at al. (2023, p. 179) assert that an exploratory study "clarifies understanding of an issue, problem or phenomenon". This made it a suitable approach for exploring the complexity of the RQ. Exploratory research is appropriate for GI because it affords the researcher the opportunity to uncover patterns and contextual factors that may not yet be firmly established in literature (Khanra et al., 2022). Also, Saunders et al. (2023) confirm that the word how is a keyword that may be used at the start of a research question for exploratory studies, which was the case for this study.

To support this exploratory approach, an interpretivist philosophy was adopted. Saunders et al. (2023) highlight that an interpretivist philosophy puts an emphasis on understanding the social world through subjective experiences of people and how they interpret of the world (Bell et al., 2019; Rabetino et al., 2021; Saunders et al., 2023). The study sought to deepen the understanding of how organisations (comprising people) effectively use their resources to drive GI, thus making the adopted philosophy a suitable option that aligns to the explorative nature of the RQ. Essentially, the exploratory nature of the study, along with an interpretivist philosophy, provides an opportunity for a deep, context-rich understanding of how organisations reconfigure resources to pursue GI.

The research assumption that was undertaken include, ontological being the "nature of reality" (Saunders et al., 2023, p. 134). In interpretivism, reality is socially constructed and subject to the perspective of the "social actors" (Saunders et al., 2023, p. 137). The RQ explored the "nature of reality" from multiple perspectives that the social actors (participants) offered. The perspectives that were offered were subject to the participant and their lived experience concerning the phenomena under study. Epistemological is about the nature of knowledge. In interpretivism, knowledge is subjective because opinions and attributed meanings are considered acceptable knowledge (Saunders et al., 2023). Rabetino et al. (2021) assert that knowledge is developed via social interactions, and this makes all types of knowledge legitimate (Saunders et al., 2023). Since diverse kinds of knowledge are valid, the knowledge of the participants as they offered their experiences and perspectives (Plakoyiannaki et al., 2019) on how their companies develop ORs for reconceiving products and markets to drive sustainable GI were used as insights.

4.2. Choice of methodology

A mono method qualitative research design was employed, meaning only one methodological choice was adopted (Saunders et al., 2023). This choice was suitable because Saunders et al. (2023) argue that qualitative designs align with the chosen interpretivist philosophy. In qualitative methods, words are meaningful representations of concepts. Plakoyiannaki et al. (2019, p. 217) describe a "naturalistic inquiry" as an approach where "researchers immerse" themselves in the setting of the study – this approach aligned well with this study. The research method focused on direct participant contact to produce intimate open-ended accounts while maintaining sensitivity to context (Plakoyiannaki et al., 2019). The qualitative method is ideal for gaining insights into complex organisational practices and perceptions (Saunders et al., 2023). This is valuable in exploring the interaction between the constructs of the RQ. Moreover, Saunders et al. (2023) assert that meaning is derived from the discussions with the participants by way of interviewing them. This is especially relevant for qualitative studies (Plakoyiannaki et al., 2019).

4.3. Population and research setting

The study's population consists of South African organisations that embrace sustainability strategies and have committed to GI to meet their sustainability objectives. These organisations would have publicly committed to sustainability by way of corporate communication, annual or sustainability reports. The organisations were identified from various top listings by sustainability aggregators found online. The aggregators were found via search engines and also based on the feedback from sustainability experts the researcher approached in their network. Given the nascency of the GI topic (Khanra et al., 2022), the limited depth in a particular industry adopting GI, the population was from a broad range of organisational sizes and industries (with some as little as 100 employees and others with well over 30 000 employees). This broad approach is justified because of needing to gain a deeper understanding of GI practices across contexts. The participants helped the scholar enrich understanding (Saunders et al., 2023) within the context of the GI domain and thus helped enhance knowledge in this arena (Khanra et al., 2022).

4.4. Unit of analysis

As commonly observed in literature the unit of analysis in qualitative research is usually people (Plakoyiannaki et al., 2019; Saunders et al., 2023; Saunders & Townsend, 2016). In this study, the unit of analysis were people working for organisations within the target population to help explore the phenomena under study. These were executives and middle-senior managers within sampled organisations, who were able to provide insight into the RQ (Aguinis & Solarino, 2019). This was an appropriate unit of analysis as it allowed the researcher to gain insights on decision-making processes, internal capabilities and organisational outcomes linked to GI. It allowed the researcher to glean from multiple perspectives from different social actors who have different contexts, all of which aligned to the adopted interpretivist philosophy.

4.5. Sampling method, sampling criteria, and sample size

4.5.1. Sampling method

The study followed a heterogeneous purposive sampling procedure (non-probability sampling) (Saunders et al., 2023). This method was relevant for the study because the nature of the method is qualitative, because it enabled the selection of a diverse set of participants. This allowed the researcher to capture diverse experiences across sectors and enabled a richer understanding of organisational contexts in exploring the phenomena under study.

4.5.2. Sampling criteria

In sampling criteria, Plakoyiannaki et al. (2019) advocate for transparency so that readers of the research material are clear on the sample used and reasons why they were selected. In response to this, the sampling criteria included organisations of various sizes and across multiple industries to ensure diverse insights (Saunders & Townsend, 2016). Organisations were also be chosen based on their public commitment to sustainability. Corporate websites, annual or sustainability reports were used to identify organisations that fit the criteria.

To put this into practice, and to recruit suitable participants, two approaches were used. First, search engines were used to identify organisations that had publicly committed to environmental sustainability via looking for top sustainability committed organisations. These lists were then reviewed to see which organisations met the sampling criteria. The researcher searched for contact details, phoned the organisations, and asked to be

directed to the sustainability department or the relevant middle-senior manager or executive to recruit them for the study.

Second, the researcher also used their professional network, asking contacts if they knew people working in sustainability roles. These potential participants were then checked against the sampling criteria to ensure that their organisations had publicly committed to environmental sustainability before being approached and recruited.

This process aligns with non-probability sampling, which is appropriate for studies where participants are selected because of their relevance to the research topic and helps overcome limitations of accessibility (Saunders et al., 2023).

4.5.3. Sampling size

As this is a qualitative study, a sample size of 15-20 participants from different organisations was considered a workable sample size (Saunders & Townsend, 2016). To this end, the researcher concluded interviews with 15 participants, however, Participant 2 did not sign the consent form, and thus their interview data was not used. This means 14 interview data points were used for the study. The level of thematic saturation determined the final sample size, this is when further interviews did not result in substantial new insights (Saunders & Townsend, 2016). The researcher observed that by the seventh interview, very little new themes were emerging. Thus, the size of the sample chosen for the study is appropriate. This ensured a robust sample to address the main RQ, maintain depth and diversity of perspectives (Saunders & Townsend, 2016; Saunders et al., 2023).

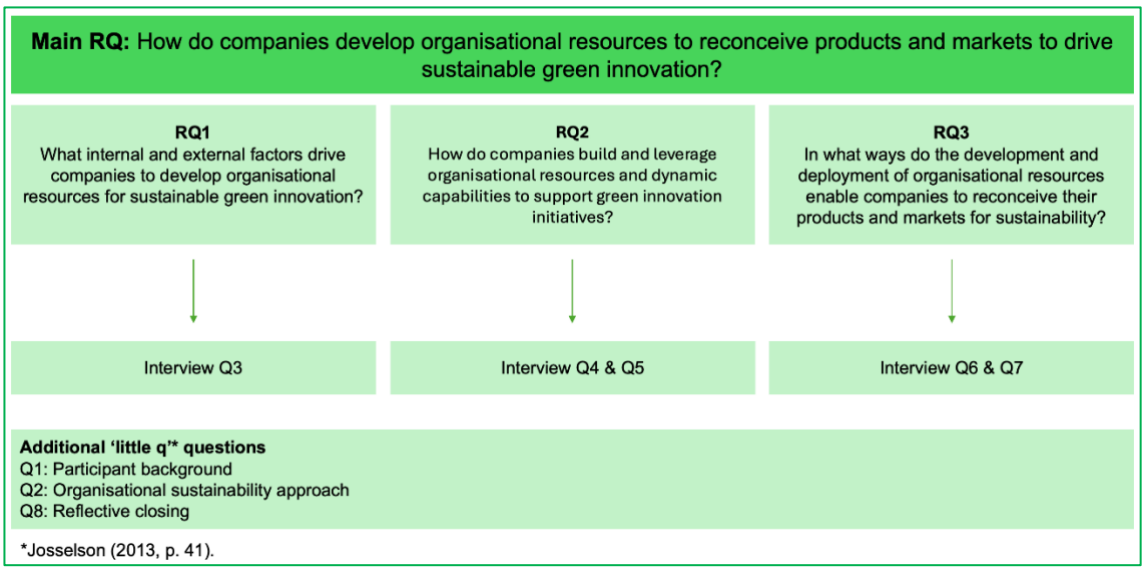
4.6. Research instrument – interview guide

The instrument that was used for this qualitative study is an interview guide (Appendix A) (Saunders et al., 2023). The guide included open-ended questions exploring the main RQ and its underlying constructs (Bell et al., 2019; Saunders et al., 2023). These allowed participants to share their views in depth (Bell et al., 2019; Josselson, 2013; Saunders et al., 2023). With open-ended questions, the exploration of meaning and significance of experiences that the participants narrated to the researcher were captured (Saunders et al., 2023). The interview guide was designed to draw out detailed narrative accounts of participants' lived experiences related to main RQ. The goal was to understand the what and the how of their experience within study's frame of reference. The instrument was

made up of eight questions inspired by the main RQ along with the research's three sub-questions. It took participants an average of about 45minutes to conclude the interview

Figure 4 illustrates that the interview questions were developed directly from the study's main RQ and associated supporting questions, ensuring consistency between the research aims, literature review and the research instrument.

Figure 4: Research instrument consistency map



Source: Author's own

Through these questions, the study aimed to capture rich, qualitative data that helped the researcher in obtaining a comprehensive understanding of the complexities surrounding GI in organisational contexts.

4.7. Data gathering process

To collect data, semi-structured one-to-one interviews were conducted. These offer flexibility (Plakoyiannaki et al., 2019; Saunders et al., 2023) via enabling participants to express their thoughts in ways structured surveys may not allow. Interviews were scheduled after ethical clearance was received. Ethical clearance was received on 15 July 2025 (see Appendix B). Online meetings were scheduled with participants (Saunders et al., 2023). The researcher used a mobile device to record the interviews and then loaded these on Otter for better transcription. Interviewing participants was well-suited for the aim of the study, because it provided flexibility while allowing for the collection of detailed, nuanced responses (Josselson, 2013). Since different types of

knowledge are valid, for this paper, it was derived through interviews where participants provided their experiences and perspectives on the RQ (Plakoyiannaki et al., 2019).

4.7.1. Recruiting participants

After identifying suitable participants, the researcher contacted them via WhatsApp text or email to outline the research and invite them to take part (Josselson, 2013). Those who agreed were then sent meeting invitations with suggested interview dates. The consent forms were sent 48-hours before the interview as a reminder about the interview and to ensure the participants understood their rights before the interview progressed. Participants agreed to the proposed dates or offered other times that worked better for them.

To stay organised, the researcher kept a tracking sheet that recorded whether each participant's signed consent form had been received. This system made it easier to follow up where needed when a consent form was not yet received from the participants who opted to only sign after the interview versus before the interview. This tracking sheet was also used to start clustering the participants according to commonalities of their sectors (see Chapter 5, Table 1: Participant clustering and colour coding).

For confidentiality, the names of the participants and their organisations have been replaced with pseudonyms (Josselson, 2013). Each participant was given a unique code for identification in the study (P1/P2 etc.). Specific job titles were not reported because some roles are highly distinctive and could reveal who the individuals are. What can be noted, however, is that all participants held roles that were directly involved in shaping and implementing sustainability initiatives in their organisations.

4.7.2. Time horizon

In terms of the time horizon, the data was collected once-off in 2025, making this a cross-sectional study (Saunders et al., 2023). It took the researcher about six weeks to conclude all the interviews with the participants, the exact period being between August and September 2025. This aided in drawing broadened insight into the phenomena (Saunders et al., 2023) of how organisations adopting sustainability strategies use their resources to drive sustainable GI.

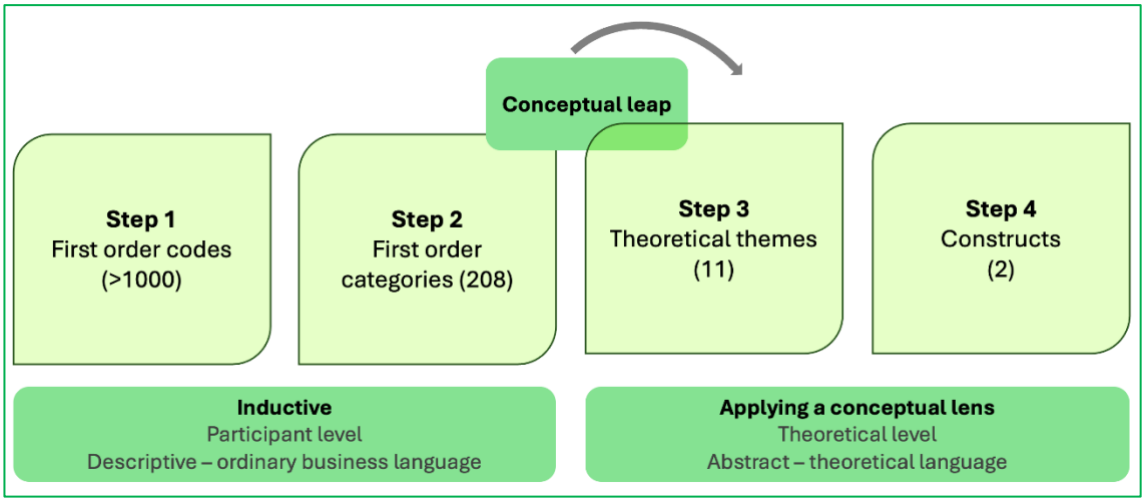
4.8. Data analysis approach

The researcher adopted a thematic analysis approach as the data analysis method. This comprised of a process of identifying key themes through data coding, as well as analysing patterns (Braun & Clarke, 2006; Saunders et al., 2023). Meaning that the researcher participated in a process of “immersion” to recognise prevalent themes and patterns that captured the essence of the participants' experiences (Braun & Clarke, 2006, p. 87). Thematic analysis is a flexible approach that is well-suited for exploratory inquiries, because it gives the opportunity for the evolution of questions asked during the coding and interrogation process as the study progresses, amidst the data collection process (Braun & Clarke, 2006). Transcripts from the recorded interviews were used as data that was analysed. Transcribing is actually noted as part of the first phase within the thematic analysis approach (Braun & Clarke, 2006) as researchers start to deeply engage with the content from the participants.

To ensure rigorous data analysis, the six steps for thematic analysis as proposed by Braun and Clarke (2006, p. 87) were followed, which include: “familiarising yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and finally producing the research report”. Data analysis took place after all the interviews were completed. However, during data collection the researcher remained cognitively alert to recurring concepts and informally noted ideas that appeared across participants. This helped the researcher track which themes were emerging and observe when thematic saturation was being approached (Saunders et al., 2023). Noting patterns during data collection also made it easier to identify which themes were consistently repeated during the formal analysis phase.

To analyse the data, the researcher used a four-step process. This process is explained in detail in the next sections that follow. Figure 5 illustrates each stage of this approach. Through this analysis, the researcher generated over 1,000 first-order codes, organised these into 208 first-order categories. These were then distilled into 11 overarching theoretical themes that fall under the two constructs outlined in Chapter 1.

Figure 5: High level data analysis process



Source: Adapted from Malete (2024).

4.8.1. Data organisation

The cleaned interview transcripts formed the main dataset for the analysis. The cleaning entailed removing identifiers of the participants and accurately attributing the parts where the transcription software could not correctly pick up what was said due to participant accent. Once the transcripts were cleaned, they were uploaded into a password protected ATLAS.ti account. This helped the researcher organise and work through the transcripts. After everything was loaded, the researcher started by coding the transcripts for meaning (Braun and Clarke, 2006), which is looking for ideas, patterns, and points that reflected how participants understood the topic (Josselson, 2013). Once the coding was underway, the transcripts were then grouped according to the sector each participant came from. This made it easier to notice similarities and differences across industries and supported the later stages of the analysis.

4.8.2. Step 1: First-order coding

Once the transcripts were loaded and organised, the researcher went through them line by line, noting statements that were meaningful. These pieces were then summarised into short expressions that captured what the participant was saying. Each of these summaries became a first-order code that can be used for further analysis (Aguinis & Solarino, 2019). This enabled the researcher to keep closely aligned with the participants' own words while beginning to make sense of the ideas they were describing. This process was followed for all transcripts and over a 1000 first-order codes were

generated. Bell et al. (2019) encourage researchers not to worry about generating too many codes in the initial stages of data analysis, because “tidying things up” (p. 531) can be considered later. With the full set of first-order codes established, the researcher then moved on to identifying connections among them to begin forming broader first-order categories.

4.8.3. Step 2: First-order categories

After the initial coding was completed, the researcher went back to the list of codes to search for patterns. This involved noticing where similar ideas appeared across different interviews, or where participants talked about related issues in different ways. By comparing these recurring ideas, the researcher grouped related codes together into broader first-order categories. This step helped to move beyond individual comments and start seeing how different pieces of data connected with one another. The researcher created 208 first-order categories from the initial first-order codes.

4.8.4. Applying a conceptual lens via a conceptual leap

After arriving at 208 first-order categories, the analysis needed a step that moved beyond simply describing what participants said. Klag and Langley (2013) explain that qualitative research involves a moment “conceptual leap” (p. 150) where the researcher shifts from organising data to seeing it in a more conceptual, theoretical way. Essentially, this is a stage where patterns in the data are looked at through a theoretical lens that helps make better sense of them (Klag & Langley, 2013). This step usually involves standing back from the codes, considering different possible interpretations, and thinking about how certain ideas link together (Klag & Langley, 2013).

In this study, this reflective step was used to look again at the refined categories and consider how they related to each other. The aim was to identify which ideas carried more weight across interviews, and how they could be understood in a more integrated way. Using a theoretical lens at this stage helped highlight the connections between organisational drivers, ORs and sustainability practices.

This process supported the move from detailed coding to the final set of eleven themes. It helped ensure that the themes are directly informed by the data and also guided by

conceptual understanding, consistent with the type of interpretive work that Klag and Langley (2023) describe.

4.8.5. Step 3: Theoretical themes

At this stage of the analysis, the focus shifted from working with the first-order categories to building a set of theoretical themes. This meant moving from detailed, descriptive coding towards a more conceptual level of understanding (Klag & Langley, 2013). The researcher used the first-order categories as the basis for constructing broader themes that reflect the underlying patterns present in the data (Bell et al., 2019).

This step involved reviewing how the first-order categories related to the emerging conceptual framework (Figure 3 in Chapter 2) and considering how they could be grouped in a way that reflected the overall meaning of the findings (Bell et al., 2019). As Braun and Clarke (2021) note, the researcher plays an active role in shaping interpretation in qualitative studies, and this interpretive work influences how themes are formed and understood. In doing so, by the guidance of Klag and Langley (2013), the researcher transformed descriptive categories into theoretically meaningful themes that form the basis of the study's overarching interpretation.

Most first-order categories fitted well within the emerging themes. However, a few did not fit neatly under the themes that could be found in the reviewed literature. Where this occurred, new themes were created so that these ideas were still represented (see Figure 6 in Chapter 5).

4.8.6. Step 4: Constructs

This step ties the empirical findings back to the study's overarching framework to show how the analysis fits within the theoretical constructs set out in Chapter 1. Meaning that the themes that emerged as a result of Step 4 were connected to the broader constructs (Klag & Langley, 2013) of the study – GI and ORs. Appendix C samples this by showing some of the first-order codes to first-order categories to theme to match the construct.

4.9. Research quality and rigour

In studies that follow an interpretive qualitative approach, meaning is shaped by the participants and by the researchers working on the project (Plakoyiannaki et al., 2019). Interpretive researchers embrace “naturalistic” markers of quality, such as “credibility, transferability, dependability and confirmability” (Plakoyiannaki et al., 2019, p. 224). These standards, as Plakoyiannaki et al. (2019) emphasise, help show that the work is transparent and grounded in the data. Reaching this level of rigour means being clear about how the study was carried out, how the context informed the interpretation, and how different parts of the data were compared to check whether patterns held up. The following section demonstrates how this was achieved for this study.

Credibility

To enhance data quality, Saunders et al. (2023) and Bell et al. (2019) recommend triangulation. In line with Saunders et al. (2023) recommendation, high data credibility was reinforced with clarifying and probing questions during the interview process, and during analysis participant transcripts were compared. To support credibility, several steps were taken to make the analysis trustworthy. Detailed descriptions “thick descriptions” (Nowell & Albrecht, 2019, p. 359) were used so that ideas shared by participants were presented with enough context for the reader to understand how meanings were formed. Coding transparency was also prioritised by clearly explaining the movement from first-order codes to the refined first-order categories and the subsequent eleven themes. The findings are closely linked to direct extracts from the interviews so that each theme is grounded in what participants actually said (Nowell & Albrecht, 2019). Analytical triangulation was also used by looking at patterns across participants, sectors and categories to check whether emerging ideas held up beyond a single interview. This can be observed across Chapter 5 through in-and-cross-case analysis conducted by the researcher.

Transferability

To show how the findings may apply in other settings (Bloomberg & Volpe, 2012), the study offers detailed descriptions of the organisational contexts and sustainability practices discussed by the participants through verbatim evidence tables in Chapter 5 (Nowell & Albrecht, 2019). This level of detail allows readers to judge whether the findings may be relevant to other organisations or sectors (Bloomberg & Volpe, 2012). This helps give a clear picture of the conditions under which meanings were constructed.

Dependability

Dependability was strengthened through an “audit trail” and clear explanation of the analytic steps (Bloomberg & Volpe, 2012, p. 113). The study outlines how the researcher adopted an interpretive lens, and moved towards developing the final themes. Appendix D includes a sample of analysis that shows how in-case-and-cross-case analysis were plotted against different first-order codes and first-order categories.

This transparency shows that the research process was systematic and that decisions can be traced (Bloomberg & Volpe, 2012).

Confirmability

As mentioned, an audit trail was kept, showing how the researcher progressed from raw data to codes, categories and eventually the final themes (Nowell & Albrecht, 2019). To strengthen confirmability, the researcher also checked whether emerging ideas appeared across different participants and clusters, which meant that the results of the findings were “grounded” in the data (Nowell & Albrecht, 2019, p. 359).

In summary, adopting these measures enhance the soundness of the data quality, bolstering the overall rigor of the research.

4.9.1. Ethical considerations

As recommended by Saunders et al. (2019), the researcher followed the university's ethical approval processes to obtain approval before collecting data (Appendix B). There was no foreseen risk of causing harm, distress or humiliation for either the participants or researcher by the topic or how data was collected (Saunders et al., 2023; Bell et al., 2019). The researcher treated the participants with respect at all times (Josselson, 2013) and they were notified of their rights, which include the right to withdraw from the study (Saunders et al., 2023).

An informed consent form (Appendix E) was prepared for all participants to sign before their data for the research project was analysed (Bell et al., 2019; Josselson, 2013). The interview data for Participant 2 was not included in the analysis, as they did not return the signed consent form. Although they chose to continue with the interview and requested to submit the form afterwards, it was never received despite several follow-up attempts by the researcher. This is possibly an example of withdrawing from the research that the participant politely exercised. At the time, their transcript had already been cleaned and imported into ATLAS.ti and initial coding had begun. However, once it

became clear that the consent form would not be provided, the transcript was removed from ATLAS.ti and excluded from the study. This is why the participant codes in the findings begin from P1 and then continue from P3 onwards.

Participants were not remunerated for partaking in the study. Confidentiality was maintained (Bell et al., 2019). Participant identities including their names or role titles, along with their organisations, are not revealed in the report. In data interpretation, their anonymity was maintained through coding, meaning instead of names, codes like P1, representing participant 1 appear (Saunders et al., 2023). After the data had gone through analysis, and the research project submitted to the university, the interview recordings will be deleted from the researcher's laptop and only stored in the cloud. This is to allow for further protection of the confidentiality of the participants and their organisations. This storage will be for a period of ten years, after submitting the final research report, as per GIBS' data storage requirement.

4.10. Limitations of the research design and methods

The limitations of this study were similar to that of other cross-sectional interview based qualitative studies undertaken by novice researchers. First, the data was collected once-off and within a short window of time - about six weeks. Second, the researcher is new to the academic research process, thus their experience was more limited than seasoned researchers. To mitigate this, the university provided the researcher with a well experienced supervisor to guide during the research process. In addition, Aguinis and Solarino (2019) and Bloomberg and Volpe (2012) advocate for transparency in qualitative research by emphasising the importance of documenting research decisions, processes and outcomes. Arguably, this enhances the integrity and impact of the findings of the research (Aguinis & Solarino , 2019), mitigating the limitations that are inherent in qualitative studies.

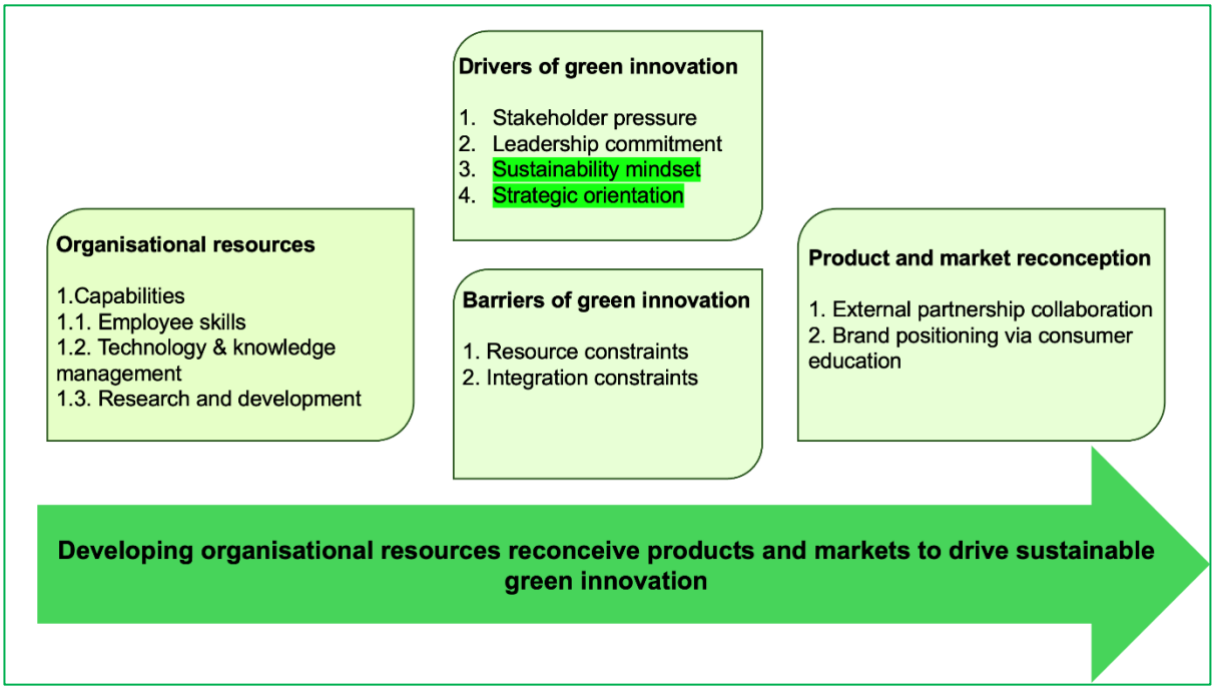
To further mitigate the said limitations, Saunders et al. (2023) encourage scholars to: adopt purposive sampling to select participants who can provide diverse perspectives; probe to get richer context from participants; triangulate using transcripts from other participants. All these were implemented to help strengthen the findings from the study.

5. Chapter 5: Findings from the analysis

5.1. Presentation of findings

This section presents the findings of data analysis conducted for this study, building on the methodology outlined in Chapter 4. Figure 6 illustrates the themes that have been mapped, including the two new themes highlighted in neon green. These additional themes fall under RQ1's GI driver construct.

Figure 6: Updated conceptual framework



Source: Author's own

From the data analysis, eleven themes were identified. This includes two of the newly emerged themes. The themes are organised according to the RQs outlined in Chapter 3, and the analysis will follow this structure throughout.

Participants are clustered as shown in Table 1 below, which is also colour-coded to clearly present the analytical evidence for ease of reference. The grouping is based on the sector most relevant to the organisations at which the participants were employed. As mentioned in Chapter 4, under ethical considerations, Participant 2 data did not form part of the analysis and was excluded from the research report.

Table 1: Participant clustering and colour coding

Cluster 1:				Cluster 2:			Cluster 3:				Cluster 4:		
Construction & Building Materials				Consumer Goods & FMCG			Retail & Pharmaceuticals				Papermaking & Recycling Services		
P3	P4	P7	P9	P1	P12	P13	P5	P6	P8	P11	P10	P14	P15

5.2. RQ1: Drivers of green innovation

As a reminder, the main RQ is how do companies develop organisational resources to reconceive products and markets to drive sustainable GI.

In the following section, the themes that are related to the research question of what internal and external factors drive companies to develop ORs for sustainable GI will be discussed will be discussed in the section that follows. The two new themes, sustainability mindset and strategic orientation, emerged under RQ1. The table below illustrates the themes and subthemes which emerged from analysing data for RQ1 under the GI driver construct.

Table 2:Themes and subthemes for GI drivers

Construct	Theme	Subtheme
Green innovation (drivers)	Stakeholder pressure	○ Regulatory compliance and environmental standards ○ Customer and market demand for sustainable products ○ Investor and shareholder sustainability expectations ○ Peer and industry benchmarking influence
	Leadership commitment	○ Strategic accountability and follow-through ○ Governance, oversight, and ethical decision-making ○ Integration of sustainability into organisational vision and identity
	Sustainability mindset	○ Storytelling for mindset shift ○ Behavioural resistance and change readiness ○ Purpose-driven organisational identity
	Strategic orientation	○ Strategic integration and alignment ○ Strategic foresight and opportunity orientation ○ Business case that links sustainability to value creation

5.2.1. Theme 1: Stakeholder pressure as a driver

5.2.1.1. Evidence of stakeholder pressure

Table 3: Evidence of stakeholder pressure as a driver of GI

P3: *"If you take finance institutes, the recent legislation changes hold them personally and jointly accountable for anything that they fund that does have an impact on the environment, so that jointly and separate accountability as an institution that provides funding to operations or to companies so as a director or a shareholder or a you can be held liable for the negative impacts that that company causes."* *3:12 ¶ 50 in Participant 3_Clean.docx*
P4: *"A lot of it has to do with climate change and carbon management and obviously fitting that with a with the legislation that South Africa is also prompting in terms of the climate change bill."* *4:34 ¶ 8 in Participant 4_Clean.docx* *So, it's always a response from the market that makes us go a certain direction.* *4:92 ¶ 69 in Participant 4_Clean.docx*
P7: *"Biggest one, is legislation. We are driven by legislation."* *7:12 ¶ 17 in Participant 7_Clean.docx* *"Our customers are our biggest bosses"* *7:59 ¶ 53 in Participant 7_Clean.docx* *"And our customers are becoming more clever in terms of environmental issues. So, we are now asked more about what are we doing in terms of CO2 reporting, outside of it really being a compliant too"* *7:17 ¶ 17 in Participant 7_Clean.docx*
P9*: :Then markets that are ready to say, what are you bringing? What does it include? Is it less carbon footprint? Will that make me? You know, my sustainability reporting looks better."* *9:25 ¶ 19 in Participant 9_Clean.docx* *"Is when you find projects, brownfields, projects that are coming up and funders to the project, are they prioritising sustainable development projects, or are they funding everyone"* *9:27 ¶ 19 in Participant 9_Clean.docx*
P1*: "Sustainability goes hand in hand with our value proposition"* *1:2 ¶ 5 in Participant 1_Clean.docx* *"I mean, our ethos is better for the planet"* *1:1 ¶ 13 in Participant 1_Clean.docx*
P12*: "So, remember we have a cradle to grave responsibility. So, whatever we do, it's very important for us to ensure that it's in 100% on compliance. From an environmental perspective, it's 100% in compliance the way we do business, and there's no repercussions"* *12:18 ¶ 27 in Participant 12_Clean.docx*
P13*: "Obviously, was to first comply with the JSE requirements. Since we are listed, obviously we have to publish this, and we use the GRI (Global Reporting Initiative)"* *13:8 ¶ 29 in Participant 13_Clean.docx*
"And obviously, because we are a listed company, a lot of people are looking at us, and we are always they always compete us with our competitors, the likes of, you know, the global guys" *13:12 ¶ 31 in Participant 13_Clean.docx*
P5*: "Now also being a JSE listed organisation, there is ESG sustainability disclosure requirements from the JSE. So that is another external factor that actually propel us to make sure that we get on with sustainability"* *5:20 ¶ 21 in Participant 5_Clean.docx* *"But then the European market says, if you're going to import any product into our market, it needs to be sustainable"* *5:23 ¶ 21 in Participant 5_Clean.docx*

"Our reputation, our share price, will actually be dragged to the woods" 5:29 ¶ 23 in Participant 5_Clean.docx
***P6**: "But we don't do things just because somebody is putting pressure on us or feel, you know, we do it because we believe inherently that that is the way we should be doing things" 6:18 ¶ 23 in Participant 6_Clean.docx* *"As a result of that, our approach includes a strong focus on environmental issues, both minimising risk on us as an organisation, but also understanding our impact on society and how we minimise that, and where there are opportunities to leverage that as well." 6:5 ¶ 11 in Participant 6_Clean.docx*
***P8:** "Regulatory pressure, I think there's an element to that, obviously, legislation. I mean, if it's legislated, we have to do it so as even though our legislation is a bit behind them the global regions" 8:32 ¶ 21 in Participant 8_Clean.docx* *"So, our investors, because we're, we are listed company, they want us to be involved in this, because it's obviously future proofing our business" 8:30 ¶ 21 in Participant 8_Clean.docx* *"They kind of had that philosophy from the get-go, and that's kind of been filtered down into the business. So internally, there's an internal pressure to maintain the philosophy of doing good is good business, because that's what our founders kind of built the business on." 8:27 ¶ 21 in Participant 8_Clean.docx* *"They want us to ensure that we are making sure it's a resilient company" 8:31 ¶ 21 in Participant 8_Clean.docx* *"So we have a small range of customers who will who are interested and keep us on track and will continue to follow our progress" 8:39 ¶ 22 in Participant 8_Clean.docx*
***P11:** "As a global organisation, there were a lot of requests coming from investors, from customers, asking what our approach is to sustainability. So that's how it started" 11:1 ¶ 11 in Participant 11_Clean.docx* *"So, a lot of our customers are global, European giants or first world giants, and they are further along in this journey, so they are still up to now asking us questions that are pushing us to move faster and faster in our strategy. So that was also a big push" 11:20 ¶ 23 in Participant 11_Clean.docx*
***P10**: "We even have what we call green funds, whereby they will only fund you if you are only going green" 10:21 ¶ 17 in Participant 10_Clean.docx* *"Are forced by legislation that they must come up with mitigation matters" 10:17 ¶ 17 in Participant 10_Clean.docx*
***P14:** "Specific regulations called extended producer responsibility. So, this is a well-known international instrument that is based on the principle of polluters pay principle. So, what happened is, government in 2021 established these regulations to hold producers of products accountable for the environmental pollution" 14:1 ¶ 11 in Participant 14_Clean.docx* *"We have the regulatory aspect, and also in terms of investor demand, right consumer demand" 14:7 ¶ 17 in Participant 14_Clean.docx* *"If you don't align yourself internationally, you can't even access international markets now. Now you start with your product here. You can't take it anywhere, because Europeans are very, quite strict in terms of circular economy products" 14:19 ¶ 25 in Participant 14_Clean.docx*

P15: *"Customers are looking for how green is this product" 15:22 ¶ 23 in Participant 15_Clean.docx*

"So, the quarterly report is what then goes out to our shareholders and our customers, and that's where our annual report eventually will come from" 15:13 ¶ 11 in Participant 15_Clean.docx

5.2.1.2. In-case analysis of evidence for stakeholder pressure

Cluster 1: Construction and Building Materials (P3, P4, P7, P9)

Participants in the construction and building materials cluster recognised that stakeholder pressure strongly shapes how sustainability is managed. All participants agreed that stakeholder expectations are indeed increasing and thus influence how their businesses behave concerning to GI. There was a common premise of seeing compliance, funding and customer demand as unavoidable drivers.

Participant 3 referred to recent legislative changes that hold financial institutions accountable for anything they fund that negatively impacts the environment. This reflected the influence of regulatory compliance and environmental standards on how organisations respond**.** Similarly, Participant 4 and 7 explained legislative requirements as a key driver of their organisation's sustainability actions, as they spoke about the need to comply to the South African climate change bill for example.

What was different with Participant 7 is they also highlighted that customers influence GI outcomes as they are increasingly holding business accountable for sustainability outcomes. Participants 4 and 9 spoke specifically about the market influencing product development outputs. What was different about what Participant 9 added, is an investor dimension and stated that funders were increasingly prioritising sustainability-oriented projects.

Cluster 2 - Consumer Goods and FMCG (P1, P12, P13)

Participants in this cluster revealed that stakeholder pressure is driven from multiple directions including regulators, consumers, and investors all demanding accountability, not to mention competitors keeping them on their toes.

Participant 12 viewed stakeholder influence through a compliance pressure lens. They explained that their organisation has a cradle to grave approach to their sustainability responsibility that is influenced by compliance.

What was different about Participant 13 is that they identified shareholder expectations and peer benchmarking as additional external factor pressure. They highlighted that their organisation has to publish sustainability reports because shareholders want to see their sustainability in action and added that they are always benchmarked against their global competitors. What was also different that Participant 1 discussed is business and brand ethos as the internal driver for sustainability – that sustainability goes hand-in-hand with their value proposition.

Cluster 3: Retail and Pharmaceuticals (P5, P6, P8, P11)

The retail and pharmaceuticals cluster participants described stakeholder pressure as a mix of regulatory enforcement, investor expectations, market and customer influence, all of which shape how sustainability is embedded. The different participants also spoke to internal drivers at various levels.

Participant 5 explained various drivers influencing business compliance towards sustainability. Chief among the reasons were being a listed company and needing to comply with regulations driven by the listing authority. What was different about what they said within this cluster is they brought in a risk management aspect – citing the protecting their business from collapse due to a compromised reputation that could be a result of not implementing sustainability strategy.

What was different with Participant 6 is that they focussed on sustainability being part of their core values and principles – that it was deeply rooted in the organisation's ethos of running a business based on values. Similar to Participant 5, they also outlined proactive risk mitigation from an environmental and climate concern perspective.

Participant 8 reflected on investor and legislative pressures, as well as their founding partner ethos of doing good is good business (similar to Participant 6). They highlighted that investors hold them accountable that if they are going to invest in their business, they want to ensure that the business is building resilience through environmental sustainability as one of the key business output metrics. What is different with them is that although they noted they have customers who follow their sustainability efforts and reporting – they were on the minority side.

Similarly, Participant 11 pointed to investor expectations and legislation as with Participant 8. However, they also added customer demand as stronger point than Participant 8. What is interesting with Participant 11 is they highlighted that their global

customers, push for sustainability commitments and that they are unlikely to do business with them if not performing well on environmental sustainability.

Cluster 4: Papermaking and Recycling Services (P10, P14, P15)

On the matter of stakeholder pressure, this cluster highlighted the constant balancing act between regulation, investor expectations, and customer-driven sustainability demands. Participant 10 described various drivers and emphasised financial drivers directly linked to securing funding from international markets. They also explained that legislation, particularly the Carbon Tax Act and the Climate Change Act, drives how intentional they are about energy inputs. This highlights regulatory compliance as an external factor influencing GI. Similarly, Participant 14 emphasised regulatory and investor expectations influences**,** but added the customer demand dimension. They stated that government regulations push for organisations to change, but investor and consumer demand also drive innovation. They further explained that if organisations do not align themselves to global standards on environmental issues, they cannot even access international markets.

Participant 15 added that customers want transparency*,* and shareholders want proof of measurable progress. This reinforces how investor and consumer scrutiny shape business priorities concerning GI.

5.2.1.3. Cross-case analysis of evidence for stakeholder pressure

Across all clusters, participants recognised that stakeholder pressure is a strong driver of sustainability. The most consistent influence across clusters was regulatory compliance. Participants described how government standards and environmental legislation influence organisational strategy. Both the Construction and Building Materials and Papermaking and Recycling Services clusters, organisations in resource-intensive industries, emphasised tightening regulations and the need to stay ahead of compliance rules - showing that environmental policy remains the primary motivator.

However, what was different with the Consumer Goods and FMCG and Retail and Pharmaceuticals clusters is that they placed greater weight on customer and market demand. Their participants explained that customers increasingly demand transparency and sustainable products, which is consistent with the public-facing nature of their industries.

Investor and shareholder expectations were highlighted more strongly in the Retail and Pharmaceuticals and Papermaking and Recycling Services clusters, where participants noted that investors ask detailed ESG questions and shareholders want proof of measurable progress. Peer and industry benchmarking featured among Consumer Goods and FMCG and Papermaking and Recycling Services participants, who compared themselves to global leaders to stay competitive.

5.2.1.4. Conclusion of evidence for stakeholder pressure

A review of the evidence revealed that organisations across all clusters are responding to multiple stakeholder pressures that influence and, in some instances, shape their sustainability agendas. Participants consistently referred to regulatory compliance and environmental standards influencing how strategies are formed. Organisations invest heavily in aligning operations with national policies such as carbon taxation and waste management regulations to remain competitive and compliant.

Customer and market demand for sustainable products emerged as another strong influence, particularly in Consumer Goods and FMCG and Retail and Pharmaceuticals clusters. Participants highlighted that customers now expect recyclable packaging and transparent information on product sustainability. This compels organisations to innovate in design as well as in sourcing materials and products.

Investor and shareholder sustainability expectations were also evident, where participants explained that more and more investors assess environmental performance before making funding decisions. Peer and industry benchmarking influence drove continuous improvement across clusters, with several participants explaining that global best practices serve as a reference point for local innovation. A notable nuance is that participants in the Consumer Goods and FMCG, as well as the Retail and Pharmaceuticals clusters, emphasised that organisational values and long-term brand purpose reinforce sustainability commitments, while participants in the Retail and Pharmaceuticals cluster additionally highlighted reputation and risk management as important drivers.

Overall, stakeholder pressure is an external factor that participants highlighted as a driver for GI. It would seem that organisations that balance compliance with market responsiveness demonstrate stronger adaptive capacity and long-term strategic alignment with global sustainability trends.

5.2.2. Theme 2: Leadership commitment as a driver

5.2.2.1. Evidence of leadership commitment

Table 4: Evidence of leadership commitment as a driver of GI

P7: *"we are now asked more about what are we doing in terms of CO2 reporting, outside of it really being a compliant tool" 7:17 ¶ 17 in Participant 7_Clean.docx* *"because we have a board that cares, right? And the intention is there. So, it's driven from the top. Everything that we do is driven from the top, and that that is a great motivator." 7:24 ¶ 23 in Participant 7_Clean.docx* *"we have an executive manager that that sits and looks at the social license, which is not the norm in a lot of even big organisations, right? Yeah, so it shows the investment that goes into that." 7:63 ¶ 55 in Participant 7_Clean.docx*
P4: *"So they say, they say, fit for purpose, cement that make sure that people don't have to buy the high strength cement for the application that is not really necessary." 4:76 ¶ 50 in Participant 4_Clean.docx*
P9 *"there's no sense of urgency that was there when the first 2030" 9:69 ¶ 61 in Participant 9_Clean.docx*
P12: *"And I don't, I've got that, I don't want to let them go, because I said to the company. I've trained these people; they've come under me. What's the benefit in training for all this thing and then letting them go, let me see the thing. So that is, that is where I am right now" 12:38 ¶ 55 in Participant 12_Clean.docx* *"So, COP 17 conference, two things happened. I became very passionate about it because as a father with a young kid, and the second thing is, I actually became vegetarian as well immediately after visiting it." 12:23 ¶ 35 in Participant 12_Clean.docx* *"So fortunately, my boss is also into the same, he believes. He says he's thinking, which I linked up was that let us focus alright on doing the ESD project, right where we are tackling sustainability as well". 12:29 ¶ 43 in Participant 12_Clean.docx*
P13: *"First comply with the JSE requirements. Since we are listed, obviously we have to publish this, and we use the GRI (Global Reporting Initiative)" 13:8 ¶ 29 in Participant 13_Clean.docx*
P8: *"And then in terms of external I also think stuff like we are signatories to a lot of global standards and national standards, and these organisations keep us in check" 8:34 ¶ 21 in Participant 8_Clean.docx*
P11: *"have you aligned your carbon emission reduction targets to SBTI or science-based methodologies? At first, we can say, no, we haven't thought about it. But over time, as they push, it has become harder and harder." 11:21 ¶ 23 in Participant 11_Clean.docx* *"We've got a responsible supply chain program that we've implemented there," 11:13 ¶ 17 in Participant 11_Clean.docx*
P8: *"supplier base is amazing" 8:64 ¶ 42 in Participant 8_Clean.docx*
P5: *"is big and really and in a global setup, you can only make a difference within the industry or within the area where you're operating" 5:1 ¶ 11 in Participant 5_Clean.docx* *"There has to be an executive that is accountable for implementation of whatever needs to happen" 5:14 ¶ 15 in Participant 5_Clean.docx*

"Internally, the drive from ESG comes from executive management" 5:25 ¶ 23 in Participant 5_Clean.docx
P6: *"when we signed off the commitments and we got the CEO in the board to agree" 6:65 ¶ 65 in Participant 6_Clean.docx* *"Customers is to say, we help you live in the way you want to. You want to resonate. It resonates with you that you want to live responsibly and ethically." 6:92 ¶ 95 in Participant 6_Clean.docx* *"but we certainly want to be part of it and playing a key role in driving some of that innovation, that's for sure" 6:140 ¶ 126 in Participant 6_Clean.docx*
P14: *"We also look at the commitments that have been taken at national level. If South Africa, for example, wants to be net zero by 2050 it means that a commitment has happened globally. There's been agreement with all global or other nations" 14:9 ¶ 17 in Participant 14_Clean.docx* *"We don't have proper education as well. In terms of waste management, nobody cares if they throw their plastic packaging on the floor" 14:52 ¶ 79 in Participant 14_Clean.docx* *"We need to align our systems, our production, with the concept of circular economy. Otherwise, we are not aligned with what's happening globally." 14:17 ¶ 25 in Participant 14_Clean.docx*
P15: *"it would be global market trends and wanting to keep our space and our share of the market and for South Africa" 15:28 ¶ 29 in Participant 15_Clean.docx*

5.2.2.2. In-case analysis of evidence of leadership commitment

Cluster 1 - Construction and Building Materials (P3, P4, P7, P9)

In this cluster, leadership commitment shows up in fragmented ways amongst participants. Participant 3 did not speak about issues pointing to leadership commitment, which was different to Participant 7, who was the most vocal about leadership commitment. Various topics were highlighted by the participant; including CO2 accountability reporting, leadership buy-in and motivation, corporate governance requirements and executive management involvement in sustainability. Participant 4 spoke about different things such as fit-for-purpose solutions of sustainability, showing a more pragmatic and performance-oriented way of balancing profit and sustainability. Participant 9 flagged the lack of urgency with some of the leaders on integrating sustainability within organisational structures as there were before – pointing to friction that slows momentum when implementation needs to happen.

While Participant 7's perspective was largely positive, they highlighted a frustration coming from the resistance and limited understanding among some of the executives. This suggests that enthusiasm for sustainability often meets inertia at senior levels, and it is not easy to deal with it.

Commitment varied, with some individuals like Participant 7 showing strong motivation, while others remain cautious or disengaged. Until that enthusiasm is converted into shared governance mechanisms and clearer executive accountability, sustainability efforts in this cluster are likely to remain episodic and personality-driven, rather than structural and enduring.

Cluster 2 - Consumer Goods and FMCG (P1, P12, P13)

In this cluster, participants expressed similar views about leadership commitment, although there were also clear differences in how they described it. What was similar is that some of the participants linked leadership to action and responsibility within the business. Participant 12, for example, spoke about leader enthusiasm, personal commitment, and buy-in, showing that some managers genuinely believe in and support sustainability. They also mentioned procurement alignment with sustainability, which, like Participant 13's focus on compliance-led sustainability, shows that for the success of sustainability, leaders are at least trying to connect sustainability with company systems and processes.

The differences lie in how deeply leaders understand and drive these efforts. Participant 12 described leadership that feels engaged and motivated, while Participant 13 presented a more rule-driven view, where compliance and meeting reporting standards are the main focus. Participant 1, in contrast, did not mention leadership commitment at all, showing that for some, sustainability leadership is not yet a visible or defining factor.

Overall, these similarities and differences reveal that leadership commitment in this cluster is present but uneven, strong in certain areas and people, but not yet widespread. So what? This suggests that while some leaders are beginning to take ownership and integrate sustainability into practical business functions, others remain limited to ticking boxes or staying silent on the issue. To strengthen leadership commitment, organisations in this cluster need to build consistency, moving from isolated enthusiasm or compliance to a shared, collective approach that ties sustainability to everyday leadership practice.

Cluster 3 - Retail and Pharmaceuticals (P5, P6, P8, P11)

In this cluster, what was similar across participants is that most of them saw leadership as directly linked to accountability and decision-making. Participant 8 and Participant 11 both mentioned accountability to global standards, which shows a shared focus on compliance and external reporting. They also spoke about supply chain involvement,

pointing to the idea that leadership commitment is closely tied to meeting stakeholder and customer expectations.

Concerning differences, Participant 5 focused on fit-for-purpose solutions and executive ownership, which describes leadership that acts decisively and takes responsibility for outcomes related to sustainability. Participant 6 on the other hand, highlighted innovation sign-off by CEO, customer values alignment, leader enthusiasm - which generally shows a more encouraging and supportive leadership tone. However, what was different with Participant 8 ad 11, was that they viewed leadership more as structures around rules and systems and had much less emphasis on personal conviction.

When thinking about these similarities and differences, it could be suggested that leadership commitment in this cluster is well established albeit it is expressed in various different ways. Some participants described leaders as drivers of innovation and having ownership in GI. The others saw them more as guardians of compliance and external accountability. This pattern suggests that the cluster is already strong on formal oversight and external alignment, but still needs to strengthen internal conviction and creativity among senior leaders. Building this balance between compliance and innovation could help turn leadership commitment from something procedural into something that genuinely shapes organisational culture and long-term sustainability performance.

Cluster 4 - Paper Making and Recycling Services (P10, P14, P15)

Leadership commitment in this cluster came across as practical and accountability driven. The participants described a strong focus on meeting external standards while still trying to manage local realities of sustainability. Participant 14 and Participant 15 both mentioned accountability to global standards, this shows that sustainability performance is closely tied to recognised frameworks and reporting expectations by regulatory bodies that monitor these standards. Participant 14 also raised issues of waste accountability and the need for global alignment on the circular economy, highlighting both the ambition to meet global expectations and the challenges of doing so consistently in practice.

In terms of the mindset of the leader, there were varying contributions from participants in this cluster. It was not that they referred to it from a leadership commitment perspective, but they referred to it in a different way. Participant 10 reflected that change management required acceptance, explaining that fear of change by unions and people often led to resistance and that limiting beliefs about GI and its socio-economic impact

hindered adoption. Participant 14 highlighted a culture of recycling to minimise waste. They also added that waste is now no longer considered as waste, but rather a resource than can be leveraged for efficiency. Participant 15's contribution to sustainability mindset was about their organisation's every decision trying to keep the 3P (people, profit, planet) balance.

The commitment, as shown here, does appear to be an internal driver of performance, with leadership making sure that compliance measures set in place lead to tangible outcomes.

Leadership in this cluster is still developing from a compliance-focused stance toward a more integrated approach. The focus on accountability provides a strong foundation, but deeper levels of collaboration and shared ownership across various teams will be essential to turn external alignment into consistent internal action and measurable results for organisations.

5.2.2.3. Cross-case analysis of evidence of leadership commitment

Across all four clusters, leadership commitment functioned as an important internal driver of sustainable GI. Yet, how this commitment appeared and was enacted varied.

What was similar across the clusters was accountability and ownership. Be it through the governance structures set in place in retail and pharmaceuticals or the very mush hands-on leadership of the papermaking and recycling services. A common thing was that leaders accepted the responsibility for the sustainability outcomes or the organisations. The emphasis on oversight, transparency, and reporting reflected a common belief that credible sustainability starts with accountable leadership.

The evidence also showed that sustainability mindset has a role to play in shaping how leadership commitment takes form. In the Consumer Goods and FMCG, and Retail and Pharmaceuticals clusters, leaders who personally believed in sustainability, seeing it as part of their beliefs and values rather than a compliance duty, demonstrated stronger and more consistent follow-through. This shows that commitment is also cognitive and moral. When leaders hold a sustainability mindset, they are more likely to integrate sustainability into daily practice and decision-making.

Another similarity was that leadership commitment often emerged from a process of learning and adaptation. In every cluster, early resistance-captured through codes like

overcoming organisational resistance-gradually evolved into advocacy and ownership. This indicates that leadership commitment is not static but develops through exposure, reflection, and organisational learning. This learning process also appeared to deepen leaders' sustainability mindset over time. As leaders became more familiar with sustainability challenges and opportunities, their thinking shifted from short-term compliance to long-term purpose, reinforcing commitment and strengthening their ability to drive change.

The differences lay mainly in motivation. In the Construction and Building Materials cluster, commitment was more about control and formal accountability via the standards that have been set in place by regulatory bodies. Leaders within this cluster prioritised governance structures and transparent reporting to ensure that sustainability standards are met to avoid tax burdens. Despite these differences though, all clusters showed that leadership commitment acts as the gateway for internal alignment-translating external expectations into internal accountability and culture. Conversely though, some of the leaders in Consumer Goods and FMCG treated commitment more as a moral and emotional investment. They became cultural drivers, which was used to inspire departmental advocacy and the embedding of sustainability within the organisational identity and brand purpose. Accountability then, is driven by shared motivation and enthusiasm rather than strict control and perhaps fear of not meeting regulatory body standards. In Retail and Pharmaceuticals, commitment centred around governance and ethical responsibility. Executives emphasised formalised structures and responsible decision-making to satisfy external bodies like regulators and investors, focusing on oversight and disclosure requirements.

A further difference was the level of integration. In clusters with strong customer visibility, such as FMCG and retail, the leadership strongly linked sustainability to innovation and competitiveness. While in the construction and recycling clusters, integration remained strongly tied to compliance and operational efficiency. Therefore, the depth of strategic integration differed across the clusters - some leaders positioned sustainability as central to value creation, while the others as essential part of risk management.

Finally, a common underlying driver across all clusters was the moral and ethical dimension of leadership. Even where language focused on governance, the intention did reflect responsibility to people, planet, and long-term stability of their businesses. Topics such as responsible decision-making and ethical leadership demonstrated that internal conviction reinforced structural accountability.

5.2.2.4. *Conclusion of evidence for leadership commitment*

To conclude, leadership commitment emerged as an internal driver for GI across all clusters. Accountability and ownership were consistent themes. In some clusters, such as Construction and Building Materials, leadership focused on compliance and formal governance, ensuring that sustainability standards were met and reported transparently. In others, particularly Consumer Goods and FMCG, and Retail and Pharmaceuticals, leaders linked sustainability with innovation, competitiveness, and ethical responsibility. These variations point to commitment developing through structural accountability and personal conviction. Across all clusters, leaders who viewed sustainability as a shared organisational goal, instead of just a compliance task, were better able to inspire collaboration and long-term focus.

Overall, the findings suggest that effective leadership commitment depends on combining clear governance with moral intent and shared responsibility. When leaders lead with purpose as well as process, sustainability starts to feel like part of how the organisation works, not just something it has to do.

5.2.3. Theme 3: Sustainability mindset as a driver

5.2.3.1. Evidence of sustainability mindset

Table 5: Evidence of sustainability mindset as a driver of GI

P3: *"In South Africa, we can still clearly see it. If you if you look at certain areas within,* *you know, a city, you'll always have areas where it's clean and everything is neat. It's not to say that it is the municipality that keeps only that area clean, because you'll find that the people take pride in the houses that they live in in those areas, and they clean up. Themselves, and then in the same city, you'll go past places where the houses are falling apart. There is waste right next to the front door outside on the pavement. And why is that? It's a cultural thing, and thereby, the internal drivers for sustainability should be the people. Should be the culture that is motivated within the company."* *3:31 ¶ 46 – 47 in Participant 3_Clean.docx*
P4: *"There's always a bit of a struggle to quantify the value that comes out of sustainability in some way or another, because it's not a direct revenue generating discipline"* *4:93 ¶ 93 in Participant 4_Clean.docx* *"I think we think of sustainability mostly as environment, but it's also on the people side, where I take care of their wellbeing"* *4:113 ¶ 8 in Participant 4_Clean.docx*
P7: *"We see it as something that you need to integrate within your processes, right? Not a stand-alone department that looks at its own things that's there and that just eats up the budget without any clear direction"* *7:5 ¶ 11 in Participant 7_Clean.docx*
P9: *"Willingness to change, willingness to develop, willingness to go into a new territory, right? Because we've been there's always, we've been making this this way,*

and it has been working, you know? So, it's also the change aspect of it, the agility of it to say, are we quick enough, and are we willing to go the route that's not conventional" 9:62 ¶ 55 in Participant 9_Clean.docx
P1: *"And we've gone so far as to have that additive that makes the bag black or green or whatever out of recycled material. And that's also an industry first. So the additive that makes the bags black actually comes from recycled tires. There's that kind of work that we do in the sustainability space, the inks that we use to print on our product are all water based, so there's no solvent involved in the inks. Again, that was a push to make the printing process more sustainable and more environmentally friendly. And then in our manufacturing process, we use water to cool the machines. And obviously, water usage is an issue in the in the world of sustainability, we've closed our loop of water usage, so the water that runs through the factory to cool the machines, because it goes back into a holding tank, is filtered and then goes all the way back. So, it's a closed loop. So, sustainability is the complete underpinning of what our business does." 1:90 ¶ 13 in Participant 1_Clean.docx* *"I mean, our ethos is better for the planet" 1:1 ¶ 13 in Participant 1_Clean.docx*
P12: *"It's a personal thing, it has to start personal." 12:21 ¶ 35 in Participant 12_Clean.docx* *"And that resonated with me because my daughter, who's 24 today was small then. So, you as a father, when people start to talk along those lines, you start to think of your child and you say, what sustainability is saying to me right now. I mean, I did. I was planning for a future to get her to university, planning for a future, to buy a car which." 12:22 ¶ 35 in Participant 12_Clean.docx* *"Where we say we don't look when you look at waste as waste, then you will see it as an expense. But you when you look at waste as an asset." 12:13 ¶ 25 in Participant 12_Clean.docx* *"And the beauty part about that is because landfill charges a disposal fee, so moving that to composting has resulted in the region of about, if I remember correctly, I think, for the three plants that we did, around about R3 million [savings]" 12:15 ¶ 25 in Participant 12_Clean.docx* *"So, I look for sustainability in everything that I do, and I package it when I'm when I'm marketing it internally into the business from a cost saving point of view" 12:3 ¶ 13 in Participant 12_Clean.docx*
P13: *"And it's something that they are trying to normalise now" 13:48 ¶ 81 in Participant 13_Clean.docx* *"I'll be honest with you, right in our exco there are two set of people. There are those who think sustainability is very important. There are those who think it's not important. So those who think it's not important, those who think it's important. Our CEO supports this, but our chief financial officer does not support this and is responsible for the money part." 13:59 ¶ 93 in Participant 13_Clean.docx* *"For example, here at head office, we no longer have bins. We have recycling sites. So, after using a cup, now you need to walk and put it with cups. We no longer use your waste bins. Or after using a bottle you need to work and then put it in a specific area. So here we're talking about the waste separation at source, waste segregation. And obviously, when you exit the room, when you leave the room, the light will switch off. And instead of using lifts, now we take the stairs if we have to. So, we are being*

intentional about sustainability, about growing green as a company or as a business" 13:73 ¶ 109 in Participant 13_Clean.docx
P5: *"The problem we have Mmapula is we think green as the after effect, and that's where we go wrong, and that's why sustainability becomes expensive. We need to actually think green during our conceptual phase before design. If we can input green before design, then green is woven into the fabric. We don't have to even see it as green. We're bringing in the efficiency of green within a product that is naturally green. But now what we're trying to do now is we actually go the conventional way and then try and change and try and make it green. And that's why this all innovation is becoming too expensive and too complicated, right?" 5:99 ¶ 78 in Participant 5_Clean.docx*
P6: *"It's not that doesn't mean everybody wakes up every morning and oh my gosh, let's go and do sustainability today. Everybody's got a job, but they understand what the ethos of this business is. And if we come in and say, Look, here we plan. You want to do X, Y and Z, there's a lot of discussion in negotiation. I'm not saying. Easy. I'm not saying I could walk into a boardroom and say, well, let's face our plastic bags tomorrow. No, that didn't happen. You've got to make a case. It's a mindset change, some real strategic changes here" 6:125 ¶ 120 in Participant 6_Clean.docx* *"When I say that sustainability, or an approach to responsible business is part of the ethos of the company, I mean that. I mean that in the sense that I've worked in in other large corporates, it's different here, in the sense that people really believe it and that makes a difference" 6:141 ¶ 120 in Participant 6_Clean.docx*
P8: *"So that's just her, I suppose, her ethos, this is what she's doing with her department, and either get on board or don't get on board. And I think that's kind of how she has been with the suppliers. These are expectations. Help us get there. If you're on board, we can do this together." 8:68 ¶ 42 in Participant 8_Clean.docx*
P10: *"The biggest challenges it can be the unions, because they have got this concept that Green Innovation is going to shed lot of jobs, which is not the case" 10:60 ¶ 47 in Participant 10_Clean.docx*
P14: *"We no longer seeing it as waste. We're seeing it as a resource" 14:22 ¶ 37 in Participant 14_Clean.docx* *"Waste can be avoided, waste can be minimised, and we have sort of a culture of recycling" 14:24 ¶ 37 in Participant 14_Clean.docx*
P15: *"So, our strategy is based on those 3P's. So, everything we do is sort of trying to keep those three legs standing, because if you go too far on the profit side, something is going to fall off. If you go too far on the environmental side, you're going to spend all your money on that, and then profits aren't coming in or, you know, then you have to fire people, and there goes your people side. So, every decision we make is really trying to keep that 3P balance. You have to have people to advance your causes so you can make a profit." 15:19 ¶ 17 in Participant 15_Clean.docx*

5.2.3.2. In-case analysis of evidence for sustainability mindset

Cluster 1: Construction and Building Materials (Participants 3, 4, 7, 9)

On the matter of a sustainability mindset, the construction and building materials cluster did not speak much about this topic. Participant 3 reflected that sustainability requires a cultural change where people take pride in their environment and actively contribute to reducing negative impact. Participant 4 highlighted that sustainability is more than about

GI, that it extends beyond environmental aspects. Participant 7 did bring up the tensions between what future generations requires and what current generation needs – which can point to introspection about sustainability actions, a mindset aspect. Participant 9 reflected on the willingness to change and develop new approaches.

Cluster 2: Consumer Goods and FMCG (Participants 1, 12, 13)

In the Consumer Goods and FMCG cluster, participants reflected varying levels of awareness regarding the sustainability mindset. Participant 1 highlighted aspects that indicate that sustainability thinking is applied in what they do within their business - pointing to sustainability being embedded in organisational thinking and everyday practice. Participant 12 demonstrated a strong personal conviction, highlighting that sustainability must start as a personal thing and if you bring cost saving first, then sell sustainability alongside it, people understand. This showed how internal belief and attitude can influence the organisations approach. Additionally, they demonstrated that when organisations change their mindsets about sustainability, it can result in profitable improvements.

What was different with what Participant 13 reflected, is that they, acknowledged organisational inconsistency as a result of sustainability mindset held by different leaders, explaining that some think sustainability is very important, others think it's not and that the CFO focuses on money, while the CEO supports sustainability. Nonetheless, there was a behavioural nudging that promotes sustainable choices in the office and starts to normalise sustainability behaviours by focusing on visible everyday behaviours.

Cluster 3: Retail and Pharmaceuticals (Participants 5, 6, 8, 11)

In this cluster, the participants expressed the most views that pointed to a sustainability mindset influencing GI within organisations. They were similar in acknowledging that organisational culture and ethical beliefs shape sustainability understanding. Participant 6 referred to belief of employees, emphasising that sustainability depends on what people inside the organisation value and accept. Participant 5 highlighted that leaders need to think green from the start, so that green is woven into the fabric of the organisation instead of adopting it as a corrective measure because then it is too late and it becomes too expensive. Similarly, Participant 8 highlighted the orientation of the leader – that the leadership needed to have a sustainability mindset in order to see success GI implementation within organisations. They gave an example of a leader that drives sustainability regardless of the targets in place thereby setting the tone for

sustainability success. What was different is that Participant 11 was less vocal on this theme.

Cluster 4: Papermaking and Recycling Services (Participants 10, 14, 15)

Participants in this cluster associated mindset with moral responsibility and practical adaptation. Cost, resistance to change, and awareness gaps emerged as differing influences across the cluster. Participant 10 reflected that change management required acceptance, explaining that fear of change by unions and people often led to resistance and that limiting beliefs about GI and its socio-economic impact hindered adoption. Participant 14 highlighted a culture of recycling to minimise waste. They also added that waste is now no longer considered as waste, but rather a resource than can be leveraged for efficiency. Participant 15's contribution to sustainability mindset was about their organisation's every decision trying to keep the 3P (people, profit, planet) balance.

5.2.3.3. Cross-case analysis of evidence for sustainability mindset

Across clusters, sustainability mindset was had varying degrees of recognition or discussion. The strongest emphasis appeared in the Retail and Pharmaceuticals and Consumer Goods and FMCG clusters, where participants described sustainability as rooted in organisational culture, leadership belief and everyday practice. These clusters reflected a view that mindset can meaningfully shape GI by embedding sustainability into strategic thinking and behaviour.

However, there was less of a reference of mindset with the Construction and Building Materials cluster, with some of their discussion centred on openness to change and recognising future-focused responsibility, rather than a deeply embedded organisational ethos. This was different to what the Papermaking and Recycling Services cluster demonstrated, which was a moderate level of mindset awareness. They framed it largely in terms of moral duty, behavioural change and overcoming resistance - particularly in labour and operational contexts.

5.2.3.4. Conclusion of the analysis of evidence for sustainability mindset

A review of the evidence revealed that organisations demonstrated varying levels of maturity in adopting a sustainability mindset. The evidence showed that storytelling and narrative for mindset shift played a role in creating awareness and promoting behavioural change, particularly through leadership communication and collective learning. Short-termism and strategic myopia emerged as barriers, as participants acknowledged that financial pressures and operational demands often limited long-term sustainability

thinking. In contrast, purpose-driven and values-based organisational identity was observed in those who viewed sustainability as integral to their business philosophy, linking ethical responsibility with organisational purpose.

Across clusters, sustainability mindset was described as both a moral conviction and a practical necessity. The findings suggest that sustained mindset change depends on leadership, consistent education, and embedding purpose within strategy. This can enable organisations to balance profit motives with long-term environmental responsibility.

5.2.4. Theme 4: Strategic orientation as a driver

5.2.4.1. Evidence of strategic orientation

Table 6: Evidence of strategic orientation as a driver of GI

P3: *"So, from our perspective, sustainability is, has formed. You know, a large part, to the point where it's actually more operational in in terms of the profitability of the company than what it is to look at alternatives in amending how we, you know, change the customer's mind. So, from our perspective, is to drive down resource consumption, to increase the rehabilitation, to decrease the waste that we do generate on site. So, it's, it's very specific, focus, but more so focused to the point where it looks at the ability for the operations to drive down costs, which then assists us in maintaining a financial step ahead with other operations to ensure that we have longevity in that sense."* *3:32 ¶ 16 – 19 in Participant 3_Clean.docx* *"We have integrated meetings between the mine planning guys, the environmental team and the operational team, so that there is that integration all the way up to the point where we can say that the resource that We are mining isn't wasted"* *3:14 ¶ 33 in Participant 3_Clean.docx* *"Earlier I talked about the roadmap, and we have a roadmap where we implement things on a phased basis. So, we start off with a high impact area, so electrical, water, diesel consumption. Then over the years, you start adding in additional things."* *3:33 ¶ 55 in Participant 3_Clean.docx*
P4: *"We are integrating the whole sustainability part into the business, so it's not a standalone so we would like to identify initiatives that can give us dual benefit, so that no one can ask you, what is the return on investment. Hence, you have to fuse that with the way of doing things, then the resources but will not be that, will not be seen as demanding, because obviously you're getting other benefit."* *4:114 ¶ 93 in Participant 4_Clean.docx* *"Materiality of our business in terms of sustainability, materiality assessment on what is really standing out for our business"* *4:43 ¶ 14 in Participant 4_Clean.docx*
P7: *"We operationalise sustainability, so it's part of the broader strategy, right? We see it as something that you need to integrate within your processes, right? Not a stand-alone department that looks at its own things that's there and that just eats up the budget without any clear direction."* *7:92 ¶ 11 in Participant 7_Clean.docx*

“You need to be able to measure your impact” 7:36 ¶ 31 in Participant 7_Clean.docx
P9: *“The best for me that I've seen is to make it part of your main process. Do not have it as a standalone project. For Green Initiative, make a core part of your business” 9:40 ¶ 37 in Participant 9_Clean.docx* *“Do not have a project department, and you have a green innovation department separate from that, make it embedded in what they are doing.” 9:41 ¶ 37 in Participant 9_Clean.docx*
P1: *“That steps into the world of what our actual brand underpinning is so [PO1] brand underpinning is our key product is [product type]. We make other product as well, but our hero product is [our product type 2]. And our [our product type 2] are made from 100% recycled material number one. But of that 100% recycled material, 75% is post-consumer waste. So, in essence, what that means is waste that was destined for the landfill. It's gone through the consumer's hands, whereas the consumers used it, and then is then it is disposed of its packaging or the product itself, and it gets intercepted before it gets to landfill and we recycle it and turn it into product.” 1:31 ¶ 7 in Participant 1_Clean.docx* *“But we found all these other advantages to these things that we didn't think about, right? So, when you use a normal ink to print on a [product type], you've got a solvent. There's a fire hazard, right? And there's an odour to it. All of that is not gone because we're using all of those things. So, there's all these little benefits, um, it's better for the world, yes, but there's all these benefits that we didn't think about, because there's no fire hazard. Your insurance comes down. So, there's all these small knock-on advantages.” 1:76 ¶ 73 in Participant 1_Clean.docx* *“We buy that recycled plastic, and the third one is for what they call your wet waste, so it's the stuff that goes to landfill and that then gets that so. But to be able to stamp that, and the pilots are all in small municipalities, and they're working well, but able to stamp that on nationally is a huge task, right? Because, I mean, you they'd have to have three collection days, and is the consumer going to adopt that? Going to look in South Africa currently, it's simple” 1:83 ¶ 97 in Participant 1_Clean.docx*
P12: *“You bring sustainability presentations, then you when you say look at the cost saving that we achieved. But apart from the cost, look at the benefits from the environmental [side]. No more going to waste. I mean, there's no longer going to landfill. We are moving into a cleaner environment we are moving this into compost. People get shocked.” 12:31 ¶ 41 in Participant 12_Clean.docx* *“So, you learn how the biggest question they're based they ask you where, where is the opportunity? You start to look at the problem as opportunity.” 12:52 ¶ 81 in Participant 12_Clean.docx* *“And every year they're doing it right and bringing people from the last three years. So, we bring others on what we do. We have an onsite waste recycling at [Area 2], and we've teamed up with a waste company.” 12:33 ¶ 45 in Participant 12_Clean.docx* *“I'm the procurement and sustainability executive for [PO12], and I think I'm being in a fortunate position of having both roles, because, if you want change, when you find opportunity in sustainable from the sustainability side, then you can also link it into the procurement in order to ensure that it does happen.” 12:1 ¶ 5 in Participant 12_Clean.docx*

P13: *"Now, another point is, if we're paying fine, how much is the fine, can we afford to pay it? So, if we can afford to pay then we are okay with paying a fine, but if not, then obviously we'll have to implement this."* *13:74 ¶ 53 in Participant 13_Clean.docx*
P5: *"So we'll apply a long-term thinking in our decision-making process to make sure that we are aligned with our long-term value, and I mean and to our long term value of being, of being net zero by 2050, that's the kind of narrative we're using in our decision making"* *5:79 ¶ 67 in Participant 5_Clean.docx* *"If you go and do electricity wheeling. It needs to make financial sense and environmental sense"* *5:35 ¶ 29 in Participant 5_Clean.docx* *"Net zero by 2050, is our ambition, and being an ambition, it might be seen as a dream. We are actually working hard to get there, and we know where our big emitting emitters are. Our biggest emitters are electricity coming from our stores, predominantly, and we look at some of our biggest contributors is our trucks. We do have big warehouses. Our trucks deliver our product to our stores, right? They are big emitters. So, in that space, we actually already testing electric vehicles to see how the electric vehicles can be incorporated for what purposes we can incorporate them"* *5:100 ¶ 73 in Participant 5_Clean.docx* *"So, we're taking a step where we're saying we as [participant organisation], we will determine what is material to us"* *5:4 ¶ 13 in Participant 5_Clean.docx*
P6: *"We want to, you know, products need to be innovative, to include the environment, well, etc. So based on that basis, the approach and the way the business operates, has this at its at its heart"* *6:4 ¶ 11 in Participant 6_Clean.docx* *"It's not that doesn't mean everybody wakes up every morning and oh my gosh, let's go and do sustainability today. Everybody's got a job, but they understand what the ethos of this business is. And if we come in and say, Look, here we plan. You want to do X, Y and Z, there's a lot of discussion in negotiation. I'm not saying. Easy. I'm not saying I could walk into a boardroom and say, well, let's face our plastic bags tomorrow. No, that didn't happen. You've got to make a case. It's a mindset changes, some real strategic changes here"* *6:125 ¶ 120 in Participant 6_Clean.docx* *"If we value where we operate, if we value the environment in which we operate, in the people we operate with, what does that mean"* *6:12 ¶ 23 in Participant 6_Clean.docx*
P8: *"We make profits for the company kind of initiatives while having that sustainability theme in it."* *8:8 ¶ 13 in Participant 8_Clean.docx* *"We want our business to be future proof, so ensuring solutions like this will help our business become future proof".* *8:24 ¶ 15 in Participant 8_Clean.docx* *"This business has kind of been built upon the ethos of doing good as good, good business"* *8:41 ¶ 22 in Participant 8_Clean.docx*
P11: *"But it's been integrated into the business strategy of [organisation name] over time"* *11:2 ¶ 11 in Participant 11_Clean.docx* *"We then needed to develop the actual strategy itself. So, we went into a materiality assessment process. And there we considered what topics are impactful to [PO11], impactful to our stakeholders, and prioritise those to see what we should be considering as material topics in our sustainability strategy"* *11:3 ¶ 11 in Participant 11_Clean.docx*

P10: *"And then the opportunity, as I've also given an example, with those that are collecting plastics from rivers. Ja, so the opportunity is that once they do that, obviously the province has got land polluted rivers, and on the other hand, they are intervening in terms of employment, because that is job creation for all those people who are running those programs in terms of removing plastics, removing pollution and using plastic to also build roads or manufacture other staffs" 10:51 ¶ 41 in Participant 10_Clean.docx* *"What they are doing is that they put up that price-money and they say, look, we encourage innovation. Just come up with concepts that you believe fit within the scope of the green economy" 10:48 ¶ 41 in Participant 10_Clean.docx*
P14: *"You have to innovate, you have to change in terms of production, you have to, you have to, otherwise you're not going to meet your target" 14:33 ¶ 49 in Participant 14_Clean.docx* *"If we partner with you is we want to understand your contribution to us, the waste minimisation sector, if you and what and part of the partnerships that we involved in is with existing companies" 14:25 ¶ 43 in Participant 14_Clean.docx* *"Provide funding and support, okay, to SMEs. We also demonstrate and market solutions, right? So, it depends on the specific stakeholder in that case. So, for example, in terms of SMEs, they are doing some credible sustainability initiatives. Because you might even find that some of those companies, they've been driving sustainability for a very long time, right?" 14:20 ¶ 37 in Participant 14_Clean.docx* *"Even though, like, it's not a listed corporate company, we try to align as much as we can with sustainable development goals. We try to as much as we can to establish our own internal ESG frameworks" 14:14 ¶ 19 in Participant 14_Clean.docx*
P15: *"Why did we meet this? KPI, why didn't we meet that? KPI, what's the plan? How far we from the years goal, etc, etc, and we do that on a monthly and a quarterly basis" 15:12 ¶ 11 in Participant 15_Clean.docx* *"And so that is the benefit of having this interdisciplinary structure feeding into those things" 15:41 ¶ 53 in Participant 15_Clean.docx*

5.2.4.2. In-case analysis of evidence for strategic orientation

Cluster 1: Construction and Building Materials (Participants 3, 4, 7, 9)

Participants in this cluster all recognised sustainability as part of strategic direction. Most of them focused on market understanding, value creation, and measuring progress. All four participants linked strategy to market responsiveness. They spoke on topics about managing market expectations, responding to market dynamics, and market evaluation for sustainability. Participant 3 highlighted that sustainability has become more operational and that they have a roadmap where they implement things on a phased approach basis. So, they started off with high impact areas, such as electrical, water, diesel consumption. The participant also spoke to integrated planning by pointing out that they ensure that different teams within the organisation plan together so integration

is all the way up to the point where they can say that the resources that mine are not being wasted.

Participant 4, 7, and 9 all addressed sustainability being embedded in business strategy, using as they mentioned sustainability as a core component and that operationalising sustainability - was part of strategy. Additionally, similar views on having clear measurements and accountability were evident amongst some participants. Participant 7 also spoke about the importance of having the ability to measure impact and report on that, while Participant 4 highlighted that it was key to be clear on the business materiality for sustainability.

Cluster 2: Consumer Goods and FMCG (Participants 1, 12, 13)

In this cluster, all three participants connected strategic direction to business growth. Participant 1 mentioned sustainability being a complete business underpinning, while Participant 12 referred to financial benefits of cost saving through sustainability initiatives. Participant 1 identified GI opportunity - new advantages discovered, and Participant 12 referred to opportunities presented through the adoption of green innovative initiatives. There was also shared long-term thinking, with both Participant 1 and Participant 12 repeating that behaviour change requires long-term commitment. Furthermore, Participant 12 also stressed financial and operational priorities, as they spoke on how GI could be seen as an opportunity to make money and that adding in procurement is a good consideration.

Participant 13 showed a different view as they referred to business opting to pay fines instead in some instances and caring about profits a bit more than sustainability initiatives.

Cluster 3: Retail and Pharmaceuticals (Participants 5, 6, 8, 11)

This cluster contained the strongest and broadest evidence that strategic orientation drove GI. The focus was on embedded sustainability, leadership ethos, *and* long-term planning. Most participants saw sustainability as integrated into their business operations. Participant 5 spoke of a fit for purpose sustainability strategy, Participant 6 referred to sustainability at the heart of business, and Participant 11 mentioned integration into business strategy. Creating business value was central to all four. Participant 5 and 6 highlighted that sustainability initiatives must make sense and that green initiatives must create value. Similarly, Participant 8 and 11 added identifying dual benefit initiatives was key and developing business case modelling for sustainability as

important. They all demonstrated a long-term outlook, where Participant 5 spoke about the long-term outlook for sustainability and Participant 8 pointed to future proofing the business. Leadership beliefs guided strategy. Participant 6 and 8 both referred to ethos – part of who we are.

What was different is that Participant 5 and 11 focused more on measurable systems, mentioning business materiality for sustainability and identifying priorities. Participant 6 though emphasised values-based leadership, with honouring and valuing the environment and that being an inherent belief within their organisation.

Cluster 4: Papermaking and Recycling Services (Participants 10, 14, 15)
Participants in this cluster viewed strategic orientation as practical, measurable, and urgent. What was similar is that all three participants referred to market opportunity and long-term vision**.** Participant 10 mentioned huge opportunities that come with GI, while Participant14 noted GI as imperative to meet sustainability targets.

Measurement and accountability were consistent themes. Participant 15 referred to ability to measure impact and report that and the importance of KPI alignment for sustainability. Similarly, Participant 14 added that business materiality for sustainability was critical in being clear about what is relevant for the business. Also, they all talked about collaboration and idea sharing, as Participant 10 and 14 pointed to encouraging new ideas and Participant 15 pointed to interdisciplinary structure for sustainability.

What was different is that Participant 14 spoke about going beyond compliance and doing more than required.

5.2.4.3. Cross-case analysis of evidence for strategic orientation
Across all clusters, participants described strategic orientation as important for driving GI, but the way this was expressed differed. A common thread across clusters was that sustainability is now part of business strategy rather than a separate activity. Participants often spoke about linking sustainability to core decision-making, long-term goals, and creating value. There were clear similarities across clusters. Many participants talked about integrating sustainability into strategy. For example, participants in Construction and Building Materials described sustainability as a core component and spoke about phased roadmaps and integrated planning across teams. Participants in Consumer Goods and FMCG also pointed to sustainability as part of business foundations, with references to long-term commitment and GI opportunities. Retail and Pharmaceuticals

participants further reinforced this through comments that sustainability sits at the heart of the business and is built into operations and leadership beliefs. In Papermaking and Recycling Services, participants highlighted business materiality, structured collaboration, and measurement as part of strategic focus.

Long-term thinking appeared across clusters, although emphasised to different degrees. In Consumer Goods and FMCG and Retail and Pharmaceuticals, participants referred directly to future-proofing, long-term commitment, and sustainability as part of who they are. Construction participants also mentioned long-term planning, but spoke more about phased implementation and resource management. The Papermaking and Recycling Services cluster linked long-term vision to opportunity and urgency.

Differences were also evident. Construction participants focused strongly on market responsiveness and efficiency. Consumer Goods and FMCG emphasised growth and opportunity, though one participant noted a tension where profit can outweigh sustainability. Retail and Pharmaceuticals presented the strongest integration, linking strategy to leadership ethos and business value. Papermaking and Recycling highlighted practical action, accountability, and collaboration, including going beyond compliance.

5.2.4.4. Conclusion of the analysis of evidence for strategic orientation

Across clusters, participants describe a similar strategic movement towards adaptability, long-term thinking, as well as evidence-based sustainability. The findings show three key aspects of strategic orientation that drive GI: strategic integration and alignment, strategic foresight and opportunity orientation, and a business case that links sustainability to value creation. Integration and alignment appear most consistently across the clusters, with participants describing how sustainability is built into operations, planning, and measurement. Foresight and opportunity reflect the forward-looking mindset that connects sustainability to growth, innovation, and future relevance. It appears strongly in the Consumer Goods and FMCG, Retail and Pharmaceuticals and Papermaking and Recycling Services. Value creation captures how sustainability initiatives generate tangible and intangible benefits, from cost efficiencies and innovation to improved reputation and stakeholder trust – which is present across the clusters. The cluster context also influences how this plays out.

Construction and Building Materials cluster focus on measurement and market responsiveness; Consumer Goods and FMCG cluster linked strategy to profitability and corporate responsibility; Retail and Pharmaceuticals cluster emphasised leadership and

values-driven strategic orientation; and the Papermaking and Recycling Services cluster combined compliance with long-term commitment. These differences suggest that external and internal values shape how sustainability becomes part of the strategy. Across these clusters, the degree of strategic foresight and opportunity orientation varied - some organisations viewed sustainability as market-driven opportunity creation, while others saw it primarily as risk mitigation and alignment. Overall, this shows that strategic orientation supports innovation, marking a shift from reacting to change to planning ahead. Organisations that build sustainability into their strategy show stronger adaptability and more potential for GI.

5.3. RQ1: Barriers of green innovation

The following section will cover findings based on barriers of GI. This is still within the research question of what internal and external factors drive companies to develop ORs for sustainable GI. Table 7 below below illustrates the themes and subthemes which emerged from analysing data for RQ1 under the GI barrier construct.

Table 7: Themes and subthemes for GI barriers

Construct	Theme	Subtheme
Green innovation (barriers)	Resource constraints	○ Budgetary and financial limitations ○ Cost-benefit and ROI trade-offs ○ Systemic supply chain and material dependencies ○ Operational efficiency and resource optimisation
	Integration constraints	○ Fragmented organisational integration and accountability ○ Weak cross-functional collaboration and governance cadence ○ Supplier and value chain misalignment ○ Limited organisational readiness for implementation (capacity and system readiness)

5.3.1. Theme 5: Resource constraint as a barrier

5.3.1.1. Evidence of resource constraint

Table 8: Evidence of resource constraint as a barrier of GI

P3: *"Over the years, start adding and building your tracker in order to ensure that you get to that point where you're not detrimentally impacting the operation or the company's ability to function" 3:17 ¶ 58 in Participant 3_Clean.docx* *"Sphere don't always recognise is the fact that finance is a you know, plays a large role within the sustainability of whatever you implement" 3:6 ¶ 12 in Participant 3_Clean.docx* *"Because I think what a lot of people within the sustainability sphere don't always recognize is the fact that finance is a you know, plays a large role within the sustainability of whatever you implement" 3:6 ¶ 12 in Participant 3_Clean.docx*
P4: *"So, if you make less clinker, not only does it benefit the CO2 is also benefit your pocket, in terms of the costs that are incurred with making of the clinker and eventually cement" 4:49 ¶ 14 in Participant 4_Clean.docx*
P7: *"Technological advances, you investigate the feasibility of using them and whether you will get value out of it, and so forth. Okay, that's the process 7:43 ¶ 31 in Participant 7_Clean.docx* *"Because if it's if it's a must, if I won't work with you, if I know that you're polluting our rivers, despite the fact that you can supply me with the best sand, gypsum, or whatever the case may be, then you are more inclined to clean up your house so that you can do business with." 7:60 ¶ 53 in Participant 7_Clean.docx*
P9: *"And say, what can we bring in to reduce consumption? You reduce consumption of what we are doing also in our process, is a carbon intensive process because we are using a lot of energy fuel. 9:38 ¶ 31 in Participant 9_Clean.docx* *"So, when it comes to what are you prioritising, production and maintenance take the first priority, and we find that that's where sustainability, or projects that are just driving innovation are lacking behind because companies are prioritising what will keep the product going out of the company" 9:56 ¶ 49 in Participant 9_Clean.docx*
P1: *"You know, that's a bit of an iffy one because it's such a price sensitive category. So, we push on our packaging, we push our value proposition that we made from recycled material, and we 100% recyclable. But the truth of it is, if a [product type 2] made out of first-generation material and there was virgin material, the unsustainable part of it is cheaper, it's more attractive to the consumer. So, I mean, we push the good for the earth bit. Yeah, but externally, price talks" 1:91 ¶ 19 in Participant 1_Clean.docx* *"So, it squashed us out. We took the decision not to fight it, and we got out of [product type 1 production]" 1:18 ¶ 39 in Participant 1_Clean.docx*
P12: *"We have to bring it in where you have to bring cost saving first, then sell sustainability along that side. So that is a strategic thinking on my part. To answer that question on sustainability" 12:25 ¶ 41 in Participant 12_Clean.docx* *"To sell sustainability into the business, because people are focused. I mean, remember, everybody alright, their jobs available is, they are driven by budgets." 12:7 ¶ 13 in Participant 12_Clean.docx*
P13: *"Is it bringing any impact to the business. So, when we talk about sustainability, to look good or to make profit." 13:29 ¶ 45 in Participant 13_Clean.docx*

"So, you can imagine how expensive that process is. We've only installed to eight of our sites" 13:22 ¶43 in Participant 13_Clean.docx
P5: *"Green innovations sometimes are expensive" 5:39 ¶35 in Participant 5_Clean.docx* *"Supply chain perspective in terms of how we generate that value" 5:52 ¶41 in Participant 5_Clean.docx*
P6: *"The starting point is efficiency, minimise how much we use we've we have an exceptionally strong process of monitoring and measuring those tools and our facilities, etc, and have improved our efficiency" 6:39 ¶53 in Participant 6_Clean.docx* *"So, efficiency is the first thing in stores." 6:45 ¶53 in Participant 6_Clean.docx* *"The bigger impact is actually in our value chain. Challenge with that is we don't control that. So, it's our partners to our suppliers. So that's where we stop. We set standards, etc. We work with them on minimising we have programs that we implement measuring practices. Want to know how much they're using." 6:49 ¶53 in Participant 6_Clean.docx* *"Our reputation, our share price, will actually be dragged to the woods" 5:29 ¶23 in Participant 5_Clean.docx* *"But those non-financial factors can actually bring your business to its knees" 5:28 ¶23 in Participant 5_Clean.docx* *"As a result of that, our approach includes a strong focus on environmental issues, both minimising risk on us as an organisation, but also understanding our impact on society and how we minimise that, and where there are opportunities to leverage that as well." 6:5 ¶11 in Participant 6_Clean.docx* *Understanding where we operate, what we do, and given out the nature of what kind of business we are, because I think it depends on your industry, your sector, the way your organisation trades, etc, to understand your environment, and in understanding that there's always a sense of minimising risk and negative impact on organisation, and certainly that's no different to us 6:8 ¶17 in Participant 6_Clean.docx*
P8: *"So, I would say capex and OPEX obviously influences what we are able to do in the degree we can do it too" 8:75 ¶48 in Participant 8_Clean.docx* *"Something simple as improving our waste diversions or working with suppliers to reduce their own environmental impact along the supply chain, which in turn, indirectly impacts ours" 8:11 ¶13 in Participant 8_Clean.docx*
P11: *"They unfortunately, the restriction we have is budget. So when you want to make a change in the package and packaging, like, say, changing the type of cardboard that's used to an environmentally friendly one, or changing the dimensions it requires money to change the actual production line, and that cost would be on us to do that, unfortunately" 11:36 ¶35 in Participant 11_Clean.docx* *"So those partnerships, we want them to leverage a little more as well to understand and unpack actual on the ground work that's being done by our partners in our supply chain" 11:45 ¶41 in Participant 11_Clean.docx*
P10: *"So, it's both from a bottom-line point of view, and also because, remember, companies will always need money from international capital markets. And then, if you*

are not sort of playing game, you will they will never fund you" 10:20 ¶ 17 in Participant 10_Clean.docx *"So, what they have done is that they have, they have sort of put up a price money. And they have sort of said to small business, because remember, it benefits both sides" 10:46 ¶ 41 in Participant 10_Clean.docx*
P14: *"Provide funding and support, okay, to SMEs. We also demonstrate and market solutions. So, it depends on the specific stakeholder in that case. So, for example, in terms of SME. They are doing some credible sustainability initiatives. Because you might even find that some of those companies, they've been driving sustainability for a very long time, right?" 14:20 ¶ 37 in Participant 14_Clean.docx*
P15: *"So, it would be a closed loop, and it would be biogenic. And the cost was prohibitive there" 15:38 ¶ 53 in Participant 15_Clean.docx* *"And we would replace it with a recovery boiler, which is a closed loop. We burn the stuff that we use in the process. So, it would be a closed loop, and it would be biogenic. And the cost was prohibitive there. So, when we did our first level of costing and we started phasing out the project, it would mean that we would go a couple of years without seeing returns, so that that hits your bottom line. 15:38 ¶ 53 in Participant 15_Clean.docx*

5.3.1.2. In-case analysis of evidence for resource constraint

Cluster 1: Construction and Building Materials (P3, P4, P7, P9)

Participants in this cluster described resource constraints as a key limitation in achieving sustainability. Financial pressure, cost efficiency, and balancing profitability with sustainability goals were recurring points that were raised. All four participants highlighted the link between financial health and the ability to innovate.

What is similar is that Participant 3, 4, and 9 reflected on a shared focus on maximising existing resources with Participant 3 speaking about building operational efficiencies and Participant 4 speaking about cost efficiency considerations in GI. Participant 9 specifically highlighted optimal resource management by addressing energy efficiency through process optimisation for example.

Participants 3 and 7 spoke about the economic viability of GI being a reason for not pursuing it fully within the organisation. Participant 7 further indicated that every innovation was filtered through cost feasibility assessments. Similarly, Participant 4, as well as 3, highlighted the requirement for balancing profit and sustainability purpose mentioning that organisations needed to be financially sustainable in considering GI.

What was different is that Participant 9 brought in a view around production prioritisation due to budget constraints and resource prioritisation. Also, Participant 7 reflected on how

image management intersected with limited resources by pointing out the criticality managing risk even under constraints was critical in order to upkeep a good reputation.

Cluster 2: Consumer Goods and FMCG (P1, P12, P13)

In this cluster, participants framed resource constraints around consumer affordability, product pricing, and maintaining competitiveness. All three participants referred to cost benefit opportunity of GI with Participant 12 and 13 also highlighting the ROI trade-off by pointing to businesses having cost savings focus. Profitability pressure was further emphasised by Participant 12 and 13, with Participant 1 adding the need to know when to exit a green product from the market due to profitability pressures.

Participant 1 strongly emphasised on affordability and consumer price sensitivity as a key barrier to GI because, they found that some GI initiatives they had embarked on became too expensive to continue pursuing, they pointed out that price talks, even if more sustainable. This highlights that customer price expectations restrict greener alternatives. What was different with Participant 12, is that their emphasis was broadly on budget constraints, while Participant 13 specifically pointed out that sustainability initiatives are expensive and that they sometimes have a negative impact on business continuity. They also questioned whether business should be pursuing sustainability for optics or rather focus on profitability.

Cluster 3: Retail and Pharmaceuticals (P5, P6, P8, P11)

In the Retail and Pharmaceuticals cluster, participants described resource constraints through the lens of operational efficiency, profitability, and balancing multiple goals within their limited budgets. All four participants referred to budget pressure and the difficulty of maintaining profitability while implementing sustainability initiatives. Participant 11 pointed to profitability vs sustainability trade-off showing that GI was often compromised when profit margins were tightened within their organisations. Similarly, Participant 6 referred to operational efficiency and optimisation while emphasising that improving internal processes was one way to cope with limited budgets.

There was also a common thread they all mentioned around the dependence on their supply chains and the need to leverage those in mitigating the restraints resources. Participant 5 and 11 highlighted the requirement to generate value from their supply chain concerning GI, while Participant 6 and 8 highlighted that because supply chain sustainability impact is higher, it was critical to ensure there is sustainable sourcing there to have a positive impact on their green initiatives

What was different is that Participant 5 realised that non-financials could bring business on its knees if not well handled. Participant 6 though highlighted business risk mitigation to protect the reputation of the organisation, showing a more defensive approach to managing sustainability within resource limits.

Cluster 4: Papermaking and Recycling Services (P10, P14, P15)

Participants in this cluster described resource constraints in terms of cost-related trade-offs, and budget constraints. Some of their perspectives were however more geared towards speaking to constraints that if turned around could encourage GI. For instance, Participant 10 raised that capital procurement influences GI, which demonstrates somewhat of reliance on financial partnerships to enable sustainability. Additionally, Participants 10 and 14 spoke about that access to green finance could encourage SMEs with workable green ideas to be more forthcoming to help larger organisations with GI. This is different to Participant 15 who highlighted high manufacturing costs associated with GI and thus questioned the and the economic viability to pursue GI.

5.3.1.3. Cross-case analysis of evidence for resource constraint

Across all four clusters, participants described resource constraints as a barrier to achieving sustainability goals, although the emphasis varied per cluster. Although each industry faced different challenges, the common view was that financial pressure and profitability strongly influenced sustainability decisions. Cost control, efficiency, and limited budgets repeatedly shaped how far organisations could go with GI.

In the Construction and Building Materials cluster, participants focused on balancing profit and sustainability by making the best use of existing resources. They agreed that innovation decisions were filtered through cost feasibility and operational efficiency. Similarly, the Consumer Goods and FMCG cluster centred on affordability and market pressures. Participants said that green products often became too expensive to maintain, and consumer price sensitivity restricted the success of sustainable options.

The Retail and Pharmaceuticals cluster also showed that profitability remained the top concern. Participants spoke about improving operational efficiency and using supply chains to manage sustainability within tight budgets. However, they agreed that financial limits still restricted experimentation with green initiatives.

In the Papermaking and Recycling Services cluster, participants shared similar worries about costs but also saw opportunities. They noted that access to green finance and partnerships could help smaller businesses contribute to sustainability. This showed a more forward-looking view, where financial collaboration was seen as part of the solution.

Across all clusters, financial resources were the main deciding factor for pursuing or delaying sustainability. While every participant recognised its importance, actions often depended on maintaining profit margins and operational survival.

5.3.1.4. Conclusion analysis of evidence for resource constraint

The researcher's overall analysis demonstrated that resource constraints strongly influenced how organisations approached GI. Across all cases, budgetary and financial limitations, profitability, and budget control were central in determining whether sustainability initiatives were pursued or delayed.

Across groups, participants expressed different but related experiences. In Construction and Building Materials, organisations focused on balancing profit with sustainability by using existing resources efficiently and ensuring financial stability before innovation. Consumer Goods and FMCG participants stressed the cost-benefit and ROI trade-offs of green products and consumer price sensitivity, showing that market affordability shaped decision-making. Within Retail and Pharmaceuticals, the emphasis was on improving operational processes and supply chain partnerships to manage limited budgets. Finally, Papermaking and Recycling Services participants underlined high costs and reliance on external funding but also recognised that collaboration and access to green finance could support progress.

Collectively, these insights revealed that while sustainability was valued, its implementation was constrained by economic realities. Resource scarcity drove organisations to adopt cautious, efficiency-based approaches rather than transformative innovation.

The findings suggest that businesses need targeted financial support, leadership commitment, and clearer policy incentives to integrate GI meaningfully into core operations. Education and training in sustainable business planning could further enable organisations to move beyond short-term cost concerns.

The analysis points to resource constraints as a decisive barrier to sustainable innovation. Overcoming these barriers through strategic investment and institutional support is essential for organisations that are aiming to align profitability with long-term environmental responsibility.

5.3.2. Theme 6: Integration constraint as a barrier

5.3.2.1. Evidence of integration constraint

Table 9: Evidence of integration constraint as a barrier of GI

P3: *"So, we started off with the very basics you started off with, you know, driving down a 10% consumption rate per type of product that you have from an electrical perspective, 5% from diesel, 10% on water, and all of this in order to drive down the consumptive rate and where wasteful utilisation was taking place, to get a grips on that, and then you start bridging out from there."* *3:34 ¶ 65 in Participant 3_Clean.docx* *"I like to speak with everyone you know and have a discussion, whether you're a plant cleaner or the excavator driver or front-end loader driver. That's everybody has some something to add, and so if you see impacts you."* *3:15 ¶ 81 in Participant 3_Clean.docx*
P4: *"We also have targets that guides us on whether within we are within the desired limit, and also then we report back to business on a monthly basis and back to the board committees on a quarterly basis to see what are we doing as a [company], how are we doing as a company."* *4:55 ¶ 14 in Participant 4_Clean.docx*
P7: *"And our customers are becoming more clever in terms of environmental issues. So, we are now asked more about what are we doing in terms of CO2 reporting, outside of it really being a compliant tool."* *7:17 ¶ 17 in Participant 7_Clean.docx* *"Sustainability reporting will be mandatory. You know, being aligned to GRI you CDP disclosures and how you are contributing to us, the SDGs is going to start doing something that is mandatory, because we want to know what your impact is to make sure that and things like green washing will start being part of our legislation."* *7:88 ¶ 71 in Participant 7_Clean.docx*
P9: *"Okay, so which means, when the department is production, department is consuming material, they know that they need to prioritise alternative, what we call alternative material, but that is waste material, because they have an KPI that's called circularity rate. So, they need to meet that KPI."* *9:50 ¶ 43 in Participant 9_Clean.docx* *"So KPIs are for departments, for individuals need to be aligned with the sustainability goal. Then everybody is thinking, how can I improve that? And at the end, it goes to your product, your product that you are making then is at a lower carbon footprint. So, yeah, back to maybe KPIs. KPIs, of individuals, have the sustainability objectives also as part of them, because basically that that's what we are looking for."* *9:51 ¶ 43 in Participant 9_Clean.docx* *"I think we are progressing, but unfortunately, I feel at a slower rate than what I thought. And yeah, so there is progress in what we are doing, but at a very slow rate, and there's no sense of urgency that was there when the first 2030, I think I alluded to it at the beginning, goals were set, right? So, we the goalpost keeps on changing, and that is just slowing things down."* *9:79 ¶ 61 in Participant 9_Clean.docx*

P1: *"Making product out of recycled material slows the machinery down because of its because of its very nature. If the machinery doesn't produce at a higher output, it becomes more expensive."1:72 ¶ 79 in Participant 1_Clean.docx* *"And then we've got a quite a complex blending system that blends the different characteristics of material into that retrofitted machinery that then produces [product type 1]." 1:50 ¶ 25 in Participant 1_Clean.docx*
P13: *"We have not done a great job communicating the sustainability strategy we just started now, and a lot of people are working on, maybe the technical guys, they didn't know the importance of sustainability in their jobs." 13:65 ¶ 95 in Participant 13_Clean.docx* *"There's a gap between our strategy and the people who are supposed to execute this strategy." 13:67 ¶ 97 in Participant 13_Clean.docx* *"And simply because everyone back then in 2019 or even priority that was committing to 2050, targets, right? That's why, after quite some time, that's where we realised that some of these targets are impossible to achieve as a business, okay? And some of them are no longer aligned to science-based targets." 13:55 ¶ 87 in Participant 13_Clean.docx* *"So, the strategy from the way we do it comes from me, because I've got both roads, and I know I am measured on both, so it's important for me to try both so sustainable. So, I look for sustainability in everything that I do, and I package it when I'm when I'm marketing it internally into the business from a cost saving point of view, so I kill two birds in one stone. "So that is the integrated strategy that we adopt at [participant organisation]." 12:8 ¶ 13 in Participant 12_Clean.docx*
P5: *"So, we specify those in the design manufacturing, and we also go and do quality control checks and comply checks at our third-party manufacturers, where we go and check that they comply to the all the ESG requirements, all the quality control requirement." 5:50 ¶ 41 in Participant 5_Clean.docx* *"Technical compliance team within [Participant 5 organisation]. So, every product you see on our shelves that bears our name, we actually audit them [suppliers/manufactures] every two years." 5:53 ¶ 47 in Participant 5_Clean.docx* *"We don't manufacture right? But it's our in-house branded product. Now we specify what sort of oil you must use from what resources might be, what sort of packaging you must use from what. So if, for example, if you buy paper, it must be approved by a specific standard, which means you are buying paper from a forest that regenerates, not forest that is actually degenerating." 5:49 ¶ 41 in Participant 5_Clean.docx*
P6: *"There was a lot of communication internally before, a lot of preparation. If you recall it that time, there's a lot of communication to customers. There were green stickers all over, on the floors, on the walls, on the outside. All of that was planned. We had come we had a two-phase communication strategy in the run up to taking out the [the product type] to prepare customers and staff. Once the change had happened, we had communication to remind you that the change had happened, until it became second nature, and then we removed that same thing with staff." 6:130 ¶ 120 in Participant 6_Clean.docx* *"Because the food business a huge business, the fashion business is a huge business within themselves, they would have central innovation and then a distributed function as it goes, as this goes down in the data level, the group we support and assist and*

sometimes innovate and push down, but in the main agenda, lists in the in the areas." 6:61 ¶ 59 in Participant 6_Clean.docx *"There was a lot of communication internally before, a lot of preparation. If you recall it that time, there's a lot of communication to customers. There were green stickers all over, on the floors, on the walls, on the outside. All of that was planned. We had come we had a two-phase communication strategy in the run up to taking out the [the product type] to prepare customers and staff. Once the change had happened, we had communication to remind you that the change had happened, until it became second nature, and then we removed that same thing with staff." 6:130 ¶ 120 in Participant 6_Clean.docx* *"Because the food business a huge business, the fashion business is a huge business within themselves, they would have central innovation and then a distributed function as it goes, as this goes down in the data level, the group we support and assist and sometimes innovate and push down, but in the main agenda, lists in the in the areas." 6:61 ¶ 59 in Participant 6_Clean.docx*
P8: *"There's dotted lines into each department to ultimately control whether or not we can fulfil our KPIs, so that, I kind of believe that it only really works if you have buy in from all departments in the company, and the best way to have all by a buy in from everyone in the company is to ensure there's a KPI that aligns with the work that they do, and then in terms of ensuring in innovation in partner space." 8:50 ¶ 30 in Participant 8_Clean.docx*
P11: *"But there's still emissions because we've counted as our scope too, and it's not helping us really reach our goals as fast as we would like to, if we owned the actual innovation ourselves." 11:61 ¶ 53 in Participant 11_Clean.docx*
P10: *"When it comes to the issue of sustainability, is that can you, when you replace it, be in a position to sustain jobs, to sustain economic growth, to sustain remember, it's a whole lot of issues when it comes to the, say, for example, the whole coal fired power station." 10:2 ¶ 5 in Participant 10_Clean.docx* *"It's also a political thing, because there is also this perception that once households, commerce, industry, agriculture, go green. They are off grid. They are reliant on themselves now for power, power, energy supply. So, what now? What's going to have to the energy revenue base of Eskom?" 10:64 ¶ 47 in Participant 10_Clean.docx*
P14: *"In South Africa, we don't have such infrastructure. And not having such infrastructure affects our outcomes in terms of environmental sustainability within the waste management sector." 14:55 ¶ 79 in Participant 14_Clean.docx* *"European countries in terms of their approach, in terms of waste management, like they have proper infrastructure, you see each and every bin, there's one for plastic, one for paper, one for general waste, like it's so visible." 14:51 ¶ 79 in Participant 14_Clean.docx*
P15: *"And I think we went in too fast and too furious, if you go back to, say, from 2015 to a little bit after covert, everybody was getting on the green bandwagon. The whole departments were being created. Whole new markets were emerging. Legislation was like, oh, we're behind. We need a climate act change. We need to start regulating this. People need to start reporting in this way. And then the number of bodies for, or, you know, green energy sustainability forums and that they just exploded. I mean, if you look at what the Europeans are signed up for, there's like, six, 700 things that you can sign up for." 15:55 ¶ 65 in Participant 15_Clean.docx*

5.3.2.2. In-case analysis of evidence for integration constraints

Cluster 1: Construction and Building Materials (P3, P4, P7, P9)

Participants in the Construction and Building Materials cluster described integration as an evolving process that required coordination across departments, accountability through consistent and measurable performance. Participant 9 spoke about embedding sustainability directly into operations. This participant also noted the importance of KPIs falling in different departments and at individual level. Similarly, Participant 7 focused on accountability, noting sustainability reporting must be mandatory for all. Participant 3 also spoke to the importance of internal integration explaining that sustainability measures must be adapted and localised and then tracked with clear KPIs tracked. All four participants highlighted that where there is no integration with organisational processed, the embedding of GI becomes difficult. Most notably, Participant 4 addressed the importance of aligning sustainability and operations and reporting on the set targets accordingly.

What is different is that Participant 9 specifically called out that implementation barriers slow down the momentum of GI. There was general consensus that if integration was not continuous, barriers for implementing GI would impede progress.

Cluster 2: Consumer Goods and FMCG (P1, P12, P13)

Participants in the Consumer Goods and FMCG cluster described integration as limited by measurement inconsistency and gaps between sustainability strategy and operational execution. Participant 13 was the most vocal on this limitation highlighting various impediments: they highlighted organisational misalignment, noting sustainability not well integrated into other functions and that there were gaps between strategy and execution, reflecting disconnection between leadership intent and operational follow-through. This resulted in implementation barriers as it hampered the organisation from meeting its targets. They also criticised unrealistic planning due to blind target setting because earlier when target were set they were overly ambitious and set too high targets.

Participant 12 presented a more process-focused view, emphasising the importance of individual KPIs as accountability for delivery along with having programmatic approaches in an effort to align sustainability and operations to embed responsibility.

What was different with Participant 1, is that they focused on operational feasibility, describing the importance of handling complexities of processes induced by GI approaches and also highlighting the importance of speed and efficiencies in production

and that adopting green approaches would have to align to these production principles in order to be successful.

Cluster 3: Retail & Pharmaceuticals (P5, P6, P8, P11)

Integration of sustainability in the retail and pharmaceutical cluster was shaped by cross-functional coordination, rigorous planning, accountability systems and value-chain integration. Participant 8 highlighted that execution depended on cross-functional buy-in and all-level staff buy-in for executing GI – essentially highlighting that progress arose from collaborative rather than top-down effort only. Similarly, Participant 6 supported this view but added that the process required rigour through articulate and meticulous planning, intense preparation before go-live of any GI programmes, and that the GI agenda must sit within each area of the business, that it cannot be siloed and only the responsibility of the sustainability department. This participant also stressed individual KPIs as accountability for delivery and trackers and KPIs to measure sustainability.

Participant 11 described the struggle to maintain momentum, citing the challenge of not meeting goals fast enough, which reflected the tension between ambition and operational capability. This was different to Participant 5 who focused on the criticality of integrating suppliers and stressing on manufacturing discipline, product manufacturing audit, quality control in sustainability, indicating accountability pressures at production level in order to meet organisational green goals.

What was consistently similar across the participants is that they all recognised that sustainability required structured systems, clear metrics, and cross-departmental cooperation, with Participant 5 emphasising partner integration via suppliers as well.

Cluster 4: Papermaking and Related Industries (P10, P14, P15)

Participants in the Papermaking and Recycling Services cluster described integration challenges as shaped by capacity gaps, inadequate infrastructure, and the difficulty of aligning sustainability goals with operational realities. Participant 15 reflected that the GI ambition unfortunately outpaced the systems available to implement it. They cited that sometimes organisations moved too fast, too furious to make sustainability commitments without understanding the depth of the integration required. Participant 14 focused more on external and structural barriers, referring to the lack of infrastructure in the country for recycling for instance impacts sustainability outcomes. They contrasted this with the European market advancement in waste management infrastructure reflecting that limited national systems slowed progress.

What was different is that Participant 10 contributed a macro perspective, citing multi-layeredness of sustainability considerations and political challenges in implementing GI. This reflects how regulatory complexity and governmental inertia can affect integration.

Similarities across the cluster showed that, in order for GI to be transformative, there had to be procedural integration, and that the constraints caused by internal or external dependencies and limited structural support impeded on the process.

5.3.2.3. Cross-case analysis of evidence for integration constraints

Across all clusters, participants described integration as a gradual, uneven process shaped by internal coordination, structural readiness, and contextual pressures. In the Construction and Building Materials cluster, participants spoke of embedding sustainability in operations, reporting on set targets, and cross-functional collaboration. Integration was described as ongoing and supported through coordinated planning and the use of KPIs. The participants noted that where processes were not aligned, GI slowed. The focus was on embedding sustainability in day-to-day operations and tracking KPIs, with coordinated planning across functions.

The Consumer Goods and FMCG cluster revealed weaker cohesion between functions. Participants 13 for instance mentioned that sustainability is not well integrated into other functions and that blind target setting existed within their organisation – reflecting fragmented implementation. While accountability structures such as individual KPIs existed, integration seemed to be more from a compliance or performance measurement perspective. Participant 1 also highlighted that integration needed to align with operational feasibility and production efficiency to be effective.

In Retail and Pharmaceuticals cluster, integration was framed around collaboration and measurement. Participants emphasised cross-functional buy-in, structured planning, and trackers and KPIs to measure sustainability, showing stronger systematisation but also reflecting frustration with coordination speed and ownership boundaries.

Finally, the Papermaking and Recycling services cluster highlighted structural and external constraints. Integration here was voiced to be hindered by infrastructure limitations and technological barriers and some participants noted that ambition at times outpaced organisational capability, slowing integration efforts.

5.3.2.4. Conclusion analysis of evidence for integration constraints

This analysis explored how participants across clusters understood and experienced integration constraints in embedding sustainability within their organisations. Across cases, these constraints clustered around four interrelated themes: fragmented organisational integration and accountability, weak cross-functional collaboration and governance cadence, supplier and value chain misalignment, and strategic-operational disconnect with blind target setting.

In the Construction and Building Materials cluster, participants emphasised operational alignment through KPIs and cross-functional cooperation. The Consumer Goods and FMCG cluster revealed fragmented integration, with sustainability often confined to specific functions and hindered by blind target setting and poor communication and a need to balance sustainability requirements with operational feasibility and production efficiencies. The Retail and Pharmaceuticals cluster showed stronger coordination and systematisation yet faced challenges in maintaining pace and clarity across departments. In contrast, the Papermaking and Recycling services cluster highlighted external barriers such as limited infrastructure, financial constraints, and technological gaps. These patterns reveal that integration weaknesses are often rooted in internal fragmentation and inconsistent governance cadence, compounded by value chain and supplier misalignment.

Collectively, these insights reveal that integration is uneven, influenced by organisational structure, maturity of the cluster sectors, and contextual pressures. For organisations, this underscores the need for leadership-led coordination and clearer performance frameworks. Addressing these systemic integration gaps - by strengthening accountability mechanisms, improving cross-functional rhythm, and aligning strategic intent with operational capacity - emerges as central to advancing sustainable innovation. Ultimately, effective integration enables sustainability via GI to move beyond compliance toward genuine organisational transformation and long-term strategic alignment.

5.4. RQ2: Organisational resources and capabilities for GI

In the following section, themes that are related to the research question of how do companies build and leverage ORs and dynamic capabilities to support GI initiatives will be discussed. The table below illustrates the themes and subthemes which emerged from analysing data for RQ2.

Table 10: Themes and subthemes for ORs

Construct	Theme	Subtheme
Organisational resources	Employee skills	○ Building organisational capability and green skills infrastructure ○ Employee empowerment and ownership in sustainability
	Technology and knowledge management	○ Integrating technology and innovation for sustainable transformation ○ Knowledge sharing and organisational learning (collaborative learning ecosystems)
	Research and development	○ Embedding sustainability into product and process design ○ Adaptive and iterative innovation practices (incremental innovation) ○ Collaborative and proof-based R&D for innovation impact

5.4.1. Theme 7: Employee skills

5.4.1.1. Evidence of employee skills

Table 11: Evidence of employee skills

P3: *"Now the problem in this case was the fact that the operator wasn't aware that he needed to switch on the pumps to get the water from our drainage systems to actually begin within the product. So, when you switched on the machine, it saw that there is no available water within the recirculatory system. And then, hence the automated system then just adds fresh water into it. So, whilst there's small impacts associated to the not understanding specific aspects of the role that they play, it does have a bigger impact on the company's image, because if you drove past there and you just see all this grey water that's floating as floating bits of cement in it, and it does look bad, and yet it all gets saved up for reutilisation, because one person didn't understand that he needed to and it's a new guy. So it goes, then, okay, so the site needs training, and then you start offering training for positions."* *3:35 ¶ 83 in Participant 3_Clean.docx*
P4: *"On the commandments as well, if your plant or your process is not stable and you don't have the knowledge or the skills for you to be able to run these plants very well, then you will not be winning. So, efficiency, plant efficiency, is on the top of the list as well. In order to make this with I think those are the few that ultimately, if you look at thermal consumption, you will be able to keep it low, your CO2 will be low. If you do less is more, selling the mid strength product, you save on CO2 emissions as well. If you efficiently run your plants, you will not be using a lot of energy, and you save on your CO2 as well. So, everything else, it's fusing eventually on the sustainability part."* *4:115 ¶ 75 in Participant 4_Clean.docx*
P7: *"And we invite everybody to sit at the table, and I think that's important, your commercial guy, your process, people and whatnot, because all those voices, you cannot run a sustainability strategy in silence, right? So, a working team is what I usually do to ensure that we have the right people and all the voices I heard and at equal footing."* *7:30 ¶ 29 in Participant 7_Clean.docx*

P9: *"Process producing that product is efficient enough, but also responsible for reducing the CO2 as commitment from the company" 9:3 ¶ 5 in Participant 9_Clean.docx* *"Who are you training and what are you training them in to ensure that you are now ready to bring in that internally have the capacity of that innovation. So, it's internal capabilities of what you are trying to achieve is very important as well when you're trying to roll out this green innovation." 9:20 ¶ 17 in Participant 9_Clean.docx*
P1: *"But when you go and purchase machinery to make [our product], that machinery is not suitable to use recycled material. It can't be done. So, you have to adapt the machinery to be able to produce something out of recycled material. And that's part of our intellectual property, is that we've got all this experience. We refit machines, we build our own machines to make product out of out of recycled material and then external factors." 1:92 ¶ 19 in Participant 1_Clean.docx* *"Internal factors is that we've got so much knowledge that sits in the organisation, and we've been using recycled material for so long that it's it, forms part of who we are. It's part of our DNA" 1:40 ¶ 19 in Participant 1_Clean.docx*
P12: *"So, we took this youth, and I was personally, and we've trained them. The company now, because of ESD, enterprise and supplier development. So fortunately, my boss is also into the same, he believes. He says he's thinking, which I linked up was that let us focus alright on doing the ESD project, right where we are tackling sustainability as well. So fortunately, we killed two birds with one stone, and with his." 12:54 ¶ 43 in Participant 12_Clean.docx* *"What are we basically doing is we are teaming up with so on the procurement side, we are buying from them. So we said to them, guys, you are doing this with your ESD, we want you to bring the material, as well as the machine, and give it to the kids on site, where we will get for you and paying them to produce it, and we will buy it from them for the use in our business." 12:26 ¶ 49 in Participant 12_Clean.docx* *"And the beauty part about that is because landfill charges a disposal fee, so moving that to composting has resulted in the region of about, if I remember correctly, I think, for the three plants that we did, around about R3 million" 12:15 ¶ 25 in Participant 12_Clean.docx* *"And if I don't do something to protect that, then I'm then what? I mean, I'm not doing the right things after having this education. So, COP 17 conference, two things happened. I became very passionate about it because as a father with a young kid, and the second thing is, I actually became vegetarian as well immediately after visiting it." 12:53 ¶ 35 in Participant 12_Clean.docx*
P13: *"To be honest, there was no plan. We're just following the science-based targets. And we're trying to align ourselves with the global competition, that's our competition. And simply because everyone back then in 2019 or even priority that was committing to 2050, targets. That's why, after quite some time, that's where we realised that some of these targets are impossible to achieve as a business. And some of them are no longer aligned to science-based targets" 13:55 ¶ 87 in Participant 13_Clean.docx* *"And the people who started all this are no longer part of the company to explain why they thought we'll be able to achieve this stuff in 2050 always create the confusion, because the people who have taken over now, including myself, we need to explain to the stakeholder, to the shareholders, why we no longer committing to the same commitment that we made in 2019 or 2018" 13:58 ¶ 87 in Participant 13_Clean.docx*

P5: *"That's why at [Participant 5 Organisation], we're running a decentralised ESG model. A decentralised ESG model is that if we've got HR, all HR elements within ESG are within the management and control of HR department. So those KPIs related to them will actually go to the HR executive. The same with warehouse, the same with clinic, the same with pharmacy. So, depending on where you are, you will be able to drive the ESG imperatives within your responsibility."* *5:15 ¶ 15 in Participant 5_Clean.docx*
P6: *"So, I mean, so that's why I spoke about packaging. We've been doing packaging innovations for years, 15, 17, maybe 20 years. In the last five or six years, specifically, we've accelerated. We've done massive we've done about four to 5000 changes in packaging. And we look at what's the most. So, packaging plays a technical role, particularly in food projecting from damage, being able to transport, labelling, preserving, lengthening life. So, in as much as we want to minimise packaging, we also have a very, very strong focus on food waste, for example, minimising food waste and loss. It's a huge problem globally, massive province, South Africa."* *6:142 ¶ 101 in Participant 6_Clean.docx* *"And we work with organisations where we can, if we have ambitions in certain areas, where global or local organisations which can support us in understanding that upskill ourselves, bring the knowledge into the organisation, etc."* *6:28 ¶ 35 in Participant 6_Clean.docx* *"And colleagues are upskilled in their job, to focus on those things, to take them into account when they're doing the primary job."* *6:33 ¶ 41 in Participant 6_Clean.docx* *"So, if we [are] sourcing protein, and the protein teams have all the and upskill themselves around, what are the issues around the sustainability issues in their world, and how do we source those products ethically?"* *6:143 ¶ 29 in Participant 6_Clean.docx*
P8: *"So, our investors, because we're, we are listed company, they want us to be involved in this, because it's obviously future proofing our business. If we're going to be if they're going to invest in our business, they want us to ensure that we are making sure it's a resilient company"* *8:31 ¶ 21 in Participant 8_Clean.docx* *"So, are we building capacity now to meet market expectation in five to 10 years time? I think that's also important to think of."* *8:80 ¶ 48 in Participant 8_Clean.docx*
P11: *"Again, our capacity building and capability building is that we've, in the past, developed the state of the class manufacturing facility in [Anonymous Town], and it was through partnerships with international customers."* *11:50 ¶ 47 in Participant 11_Clean.docx*
P15: *"It's not a new team. We're using existing skills. Obviously, we'll bring in a couple extra heads for the admin part, because if my job is to run a boiler, I'm not going to spend half my days just collecting numbers about running the boiler"* *15:46 ¶ 59 in Participant 15_Clean.docx* *"So that technical expertise is on the ground. We have engineers looking at that all the time, and when it starts becoming in the news, it starts getting traction"* *15:50 ¶ 59 in Participant 15_Clean.docx*

5.4.1.2. In-case analysis of evidence for employee skills

Cluster 1: Construction and Building Materials (Participants 3, 4, 7, 9)

Participants in this cluster viewed employee skills as important to embedding sustainability within core operations, that building organisational capability and continuous learning are prerequisites for GI. Developing in-house technical and collaborative skills was seen as key to scaling innovation and ensuring sustainability is not an add-on, but an important aspect to infuse into how organisations work.

Participant 7 emphasised operationalising sustainability through cross-functional collaboration and ensuring every department understands their role in implementation. What was different with Participant 9 is that they linked green skills to efficiency and innovation, noting that process optimisation and energy performance depend on technical capacity and training. Participant 4 did not really speak directly to employee skills in relation to, they did however allude to it by talking about general technical capacity to achieve plant efficiencies and fusing sustainability into it as a critical factor. What is different with what Participant 3 described was that it was important to train different levels of staff in how their day-to-day roles impact sustainability efforts of the organisation, especially ensuring that new employees receive this training to avoid sustainability leaks.

Cluster 2: Consumer Goods and FMCG (P1, P12, P13)

In this cluster, participants revealed that embedding sustainability depends on employee capability and knowledge transfer. Participant 1 discussed how because their organisation has been in the industry for a long time, they have expert knowledge of running their business in a sustainable manner. They also spoke about R&D teams having a strong focus on their machinery to deliver operational efficiency demonstrating process competence. This highlights a need for technically skilled and adaptable teams. What was different is that Participant 13 highlighted that the people who were there at the beginning of their sustainability journey had left the organisation and no one else understood why the targets that were set in place were so high. This points to a limitation in organisations capacity, as there was also no plan that was put in place, further evidencing that perhaps stronger employee capacity building for sustainability was required within their business.

Participant 12 emphasised a different aspect of employee capability building. They spoke about training youth to be able to work with one of their suppliers whom they had a green initiative with, that was saving the business millions, showing that not only is building capability important, but it can also be done through partnerships. They also spoke about

their own education as a leader in the business and how that changed how they looked at sustainability and was the beginning of their sustainability passion.

Cluster 3: Retail and Pharmaceuticals (P5, P6, P8, P11)

On the matter of employee skills, participants in this cluster highlighted that acquiring green skills is fundamental for embedding sustainability within operational practices. Participant 5 highlighted that to facilitate ownership of sustainability goals, different executives own this with their teams to enable operational performance, where their executives can translate sustainability goals into operational performance. What was different is that Participant 8 noted that resilient companies invest in sustainability, this links futureproofing to continuous employee upskilling as they mentioned that it is important to prepare people for the future and develop the right skills for where the world is going.

Participant 11 highlighted that their organisation, through international customer partnerships, has previously built state of the class manufacturing facility locally, to be able to service their Sub-Saharan market - which point to capacity building which would include employee capability building. Participant 6 rather described how they work with different partners to build internal capability through upskilling teams who work on the different departments – from fresh produce, dairy, fashion, to beauty – to enable GI within their organisation.

Cluster 4: Papermaking and Recycling Services (P10, P14, P15)

In the Papermaking and Recycling Services only Participant 15 addressed capacity building in terms of creating capabilities internally. The other participants did not speak to employee capacity building. Participant 15 described capacity building as an interdisciplinary effort, integrating sustainability into existing technical and managerial roles while encouraging collaboration across departments and regions. They emphasised leveraging in-house expertise and adapting team structures to the needs and resources of each site.

5.4.1.3. Cross-case analysis of evidence of employee skills

Across clusters, participants framed employee capability as the engine of sustainable transformation. Participants viewed green skills as both adaptive capacity and strategic leverage, showing that sustainability maturity depends on continuous learning and embedding sustainability competencies into core business practice. In Construction and Building Materials, skills development centred on operationalising sustainability through

technical learning and cross-functional capability building. Training was seen as important to embedding sustainability day-to-day practice. In Consumer Goods and FMCG, capability building focused on education, awareness, and behavioural change, alongside technical expertise in production processes and R&D – highlighting the need for continuity and knowledge transfer.

Retail and Pharmaceuticals participants highlighted future-oriented skills and emphasised training employees to translate green goals into measurable operational outcomes, supported by structures upskilling and external partnerships. In Papermaking and Recycling Services, only one participant discussed capacity building, and they emphasised interdisciplinary skills and internal expertise sharing.

5.4.1.4. Conclusion of analysis of evidence on employee skills

This analysis showed that across all clusters, building employee skills and organisational capability formed the backbone of GI. Participants consistently linked sustainability progress to the availability of skilled, informed, and empowered employees who can translate strategic goals into daily operational practices. This sense of empowerment of having autonomy and support to act, was seen as important in addition to the technical skills that enable employees to make meaningful contributions towards sustainability. What is evident also, is that developing green skills was not only about technical knowledge and capacity but also about fostering awareness and the ability to act adaptively within environmental and market contexts that are constantly evolving.

Clusters varied in emphasis. Construction and Building Materials focused on operational learning, cross-functional understanding and technical skills. Consumer Goods and FMCG highlighted awareness, education, and behavioural change. Retail and Pharmaceuticals stressed forward-looking skillsets and technical training. Papermaking and Recycling Services emphasised applied technical capacity building where it was happening. One participant reflected on interdisciplinary internal learning. The others did not strongly highlight employee skills.

The findings reveal that organisational sustainability maturity depends on continuous learning, internal knowledge exchange, and organisations being deliberate about skill investment. Within this context, employee competence becomes a catalyst and constraint for sustainability transformation. For organisations, this shows the importance of needing to institutionalise sustainability education by also aligning training systems with innovation objectives and cultivating a culture where every employee understands

and contributes to environmental goals. This strategic investment in green-skills has the potential to enable business to take sustainability from just an aspirational intent into a performance-driven practice that is deeply embedded within organisations.

5.4.2. Theme 8: Technology and knowledge management

5.4.2.1. Evidence of technology and knowledge management

Table 12: Evidence of technology and knowledge management

P3: *"We have a roadmap where we implement things on a phased basis. So, we start off with a high impact area, so electrical, water, diesel consumption. Then over the years, you start adding in additional things."* *3:33 ¶ 55 in Participant 3_Clean.docx* *"Then you start adding on to that. And as you build the company, and as you become more mature and there is more movement available, and as the system becomes more available for or becomes more robust, in order to add additional aspects in, you start adding in. And thereby you grow your sustainability portfolio within the business, whilst not detrimentally impact the business as a whole"* *3:36 ¶ 57 in Participant 3_Clean.docx*
P4: *"There's a lot of world or global wide applications that I feel we're still far from there's a lot of digitalisation that I think still needs to happen for us to be able to get accurate information and to manage the field better"* *4:106 ¶ 114 in Participant 4_Clean.docx* *"There is exposure to other cement plants around the world as well, we are planning to construct a new state of the art green cement plant."* *4:82 ¶ 56 in Participant 4_Clean.docx*
P7: *"I mean we commissioned a new automated feeding system last year in November, which is faster, safer and which is more cost effective in terms of how much electricity it uses and so forth, and it doesn't need too much manual intervention"* *7:21 ¶ 23 in Participant 7_Clean.docx* *"We look at what the industry is doing that's important."* *7:26 ¶ 29 in Participant 7_Clean.docx*
P9: *"I do process optimisation and process optimisation in my field includes energy efficiency. So then also now we're looking at decarbonisation. So therefore, we are trying to reduce our carbon footprint and also taking out to the customer a product that has less carbon footprint as well. So, then I will, I'm involved with ensuring that the process producing that product is efficient enough, but also responsible for reducing the CO2 as commitment from the company. I lead projects that involve efficiency and CO2 emissions reduction."* *9:1 ¶ 5 in Participant 9_Clean.docx* *"So, training and development. I'm going back to learning and development, but it's for companies to say, yes, you have been doing this, but there's a new skill that's available"* *9:33 ¶ 25 in Participant 9_Clean.docx*
P1: *"That we've got so much knowledge that sits in sits in the organisation, and we've been using recycled material for so long that it's it, forms part of who we are. It's part of our DNA"* *1:40 ¶ 19 in Participant 1_Clean.docx*

“You have to adapt the machinery to be able to produce something out of recycled material. And that's part of our intellectual property, is that we've got all this experience. We refit machines, we build our own machines to make product out of out of recycled material” 1:41 ¶ 19 in Participant 1_Clean.docx
P12: *“So got 10 people onsite where we've trained these kids from a waste sustainability point of view, we bought them a bailing machine, which is R400,000 which came in from R5 million the company put into this project” 12:34 ¶ 43 in Participant 12_Clean.docx* *“If you're going to instruct people and stuff on sustainability, you would have to Google, to find out a what is it that you are talking about. So, whilst studying sustainability” 12:55 ¶ 35 in Participant 12_Clean.docx*
P13: *“Some of these products, they're just testing them to see how the market responds, just a pilot. So, if the market responds very well, and then they'll continue with it.” 13:25 ¶ 45 in Participant 13_Clean.docx* *“Some of the things that we pilot, you don't even see them as a consumer, because they don't pass that critical stage.” 13:35 ¶ 55 in Participant 13_Clean.docx* *“To be honest, there was no plan. We're just following the science-based targets. And we're trying to align ourselves with the global competition, that's our competition, okay? And simply because everyone back then in 2019 or even priority that was committing to 2050, targets, right? That's why, after quite some time, that's where we realised that some of these targets are impossible to achieve as a business.” 13:55 ¶ 87 in Participant 13_Clean.docx*
P5: *“If you go and implement solar, for example, we need return on investment. It needs to now contribute to lowering the operating expenditure of our warehouses. If you go and invest in LED lighting, for example, it needs to lower the operating expenditure of our organisation. If you go and do electricity wheeling. It needs to make financial sense and environmental sense” 5:34 ¶ 29 in Participant 5_Clean.docx* *“We actually already testing electric vehicles to see how the electric vehicles can be incorporated for what purposes we can incorporate them” 5:82 ¶ 73 in Participant 5_Clean.docx* *“We do have a technical compliance team within [the organisation]. So every product you see on our shelves that bears our name, we actually audit them every two years” 5:53 ¶ 47 in Participant 5_Clean.docx*
P6: *“However, the teams that are we lend support as a central team, we have expertise sitting within the businesses that have sustainability expertise. And as part of that, like I mentioned, we work with third parties or where this need to bring in expertise to inform and educate, or send our people to learn, to enable them to learn, be able to embed sustainability in the in the areas of work, then that's an ongoing thing.” 6:29 ¶ 41 in Participant 6_Clean.docx* *“[We] have improved our efficiency, for example, energy over the last 17 or 18 years, by about 65% we're exceptionally energy efficient. So, our equipment sourcing, how we run operations or stores” 6:40 ¶ 53 in Participant 6_Clean.docx* *“We also then have scorecards and KPIs, etc, that measure and tracking all of those kind of things” 6:34 ¶ 41 in Participant 6_Clean.docx*

P8: *"So, we have reverse vending machines or E-waste bins, with where our customers bring in the waste, and then we link it to our connections in the recycling industry" 8:14 ¶ 15 in Participant 8_Clean.docx* *"We also have partnerships outside of PROs, like [organisation name] and this is obviously a paid partnership that we subscribe to, and through that we get, obviously advice as to how we improve our supply chain, but they also connect us with other experts in the field" 8:58 ¶ 30 in Participant 8_Clean.docx*
P11: *"Our renewable energy intake is increasing, we first went with solar, but then we start with biomass boilers, and we're looking beyond even that to see, you know, what are more innovative ways to improve internally" 11:70 ¶ 53 in Participant 11_Clean.docx* *"So how better can, how can we still stay within regulatory requirements, but also reduce the footprint and the environmental impact of the packaging of our products? So we we're seeing technologies out there, such as QR codes for instead of leaflets, because leaflets take up a big part of your box if you open a poll box, yeah, so scanning a QR code, because a lot of people have access to cell phones" 11:34 ¶ 35 in Participant 11_Clean.docx* *"So for example, there's platforms like [platform name] that actually complete an assessment, an ESG assessment, about the things that your company is doing from a strategy governance perspective, and it gives you a rating, like you're a gold medal, silver medal, but then you do that for your suppliers, and you then get a visibility into the sustainability performance of your supply base" 11:41 ¶ 41 in Participant 11_Clean.docx* *"So we don't want to gatekeep the innovation for ourselves, but it's important that in order for us to create access that other manufacturers are also able to produce at higher volumes" 11:51 ¶ 47 in Participant 11_Clean.docx*
P10: *"So, what they are doing that they are encouraging local people to sort of come up with projects like build, I mean, manufacturing brick plants that uses fly ash. Why it's less energy intensive, it's environmentally friendly" 10:72 ¶ 11 in Participant 10_Clean.docx*
P14: *"You might find that in the energy space - a lot of innovation is happening in terms of new design of infrastructure that need zero produce zero carbons. You see now there's an emergence of electric cars. So, it's mostly going to be driven by technology. So, the environmental innovation is going to be technology driven" 14:56 ¶ 85 in Participant 14_Clean.docx*
P15: *"Every month we then collect our data. We've got various systems, and we check our performance against the KPIs, and really reports that will come from my side, a sustainability manager for the site, we report then the performance. Why did we meet this? KPI, why didn't we meet that? KPI, what's the plan?" 15:11 ¶ 11 in Participant 15_Clean.docx* *"And the same for the group we might say we're targeting X ton reduction per ton of product in carbon emissions. And it might not be smart to do it in this region. It might be smarter to do it in the other region. And that's the benefit of this, let's call it sustainability forum, where it's people from different regions and in different areas of expertise, expertise, because now me, as a technical person, would go, the amount of biomass we need is so much and it's not there. And the environmentalist would say, yes. And then it also changes our legal framework. We would have to go from this to this. We'd have to reapply for that. And so, the money people will go, yeah,*

no, it'll cost too much. And so that is the benefit of having this interdisciplinary structure feeding into those things" 15:41 ¶ 53 in Participant 15_Clean.docx

5.4.2.2. In-case analysis of evidence of technology and knowledge management

Cluster 1: Construction and Building Materials (P3, P4, P7, P9)

Participants in this cluster emphasised that technology adoption and digital process integration were important to advancing sustainability. Continuous knowledge exchange between technical and operational teams were regarded as essential organisational competencies for sustaining these advancements. Participant 3 acknowledges that technology is treated as an evolving organisational resource that is continually developed and adapted to meet changing sustainability goals. Their organisation implements new systems and processes in phases, aligning improvements with their operational maturity and context-specific needs. Participant 4 highlighted that there was a lot of digitalisation that still needs to happen for their organisation to get accurate information for better management. They also stressed the importance of exposure to other cement plants around the world for keeping up with knowledge and technological advances in sustainability.

Participant 7 discussed using digital tracking and monitoring systems to measure sustainability progress. Similarly, Participant 9 highlighted that leveraging technology for process optimisation and energy efficiency is critical to embedding sustainability into daily operations. They also emphasised that continuous learning, research, and cross-functional collaboration are essential for effective knowledge management in driving sustainability initiatives.

Cluster 2: Consumer Goods and FMCG (P1, P12, P13)

Technology integration in this cluster was linked to improving operational efficiency. Participant 1 emphasised their extensive experience and expertise in working with recycled materials to create various products as a core resource. They described actively adapting and enhancing machinery to improve processes, treating technological innovation and practical know-how as their key assets. Moreover, they noted that many team members had long organisational tenure, reflecting how technological expertise and institutional memory have become enduring internal capabilities that sustain efficiency and innovation continuity. What is different with Participant 12 is that they described using practical technology, like bailing machines, to support sustainability projects but does not discuss technology as a strategic resource like Participant 1. They

also approached knowledge management informally through personal learning without mention of formal organisational systems.

Participant 13 described technology adoption such as solar panels, LED lighting, and recyclable materials, as valuable but often costly and limited in business impact. They explained that implementation of new technologies was usually piloted, with scale-up only if cost-effective and supported by market response. Moreover, knowledge management was identified as a weakness, with organisational memory lost after staff departures, which prompted their recent efforts to improve communication and internal awareness on sustainability goals.

Cluster 3: Retail and Pharmaceuticals (P5, P6, P8, P11)

Participants described technology and knowledge systems not only as facilitators of measurement but also function as knowledge-exchange hubs that promote continuous improvement and operational resilience.

Participant 5 highlighted the use of technologies like solar, LED lighting, and exploration of electric vehicles to lower operational costs and emissions. They emphasised knowledge management through technical compliance teams, regular sustainability audits across their business, as well as supplier ESG screenings. These systems ensure sustainability is integrated into operations and supply chain practices. Participant 6 described how the organisation invests in upskilling teams and sharing sustainability expertise across departments. Technology, such as energy-efficient equipment and advanced packaging solutions, was leveraged to enhance sustainable business practices. Ongoing partnerships, data tracking, and performance metrics are used to support continuous knowledge management and improvement.

Participant 8 explained that technology, such as reverse vending machines and e-waste bins, enables practical sustainability solutions. In describing knowledge management, they rather pointed to it as being facilitated through industry partnerships and forums more than internal focus. Collaboration and innovation are viewed as essential resources for achieving organisational sustainability. Participant 11 highlighted leveraging advanced technologies like closed-loop water systems, renewable energy, and innovative packaging for sustainability. They use digital supply-chain platforms and ESG assessment tools to monitor and improve performance. Knowledge sharing is emphasised, with a commitment to industry-wide learning and not gatekeeping innovations.

Cluster 4: Papermaking and Recycling Services (P10, P14, P15)

Across this cluster, participants viewed technology and knowledge management as an important tool for transformation. Participant 10 only spoke about technology as it pertains to SME partners – where they explained that they encourage local manufacture of eco-friendly bricks and roads using recycled materials. These technological solutions are highlighted as key drivers in supporting GI and transformation toward environmental goals. Participant 14 emphasised that technology is a vital resource for advancing future sustainability, with environmental innovation expected to be technology-driven through software solutions and waste management infrastructure. They however did not speak about technology as it pertains to their organisations, it was more on their outlook.

Participant 15 was the only one who was a bit more direct on technology within their organisation. They highlighted that technical expertise and knowledge sharing are critical ORs that enable the identification, evaluation, and implementation of sustainable technologies. They pointed to the importance of collaborative problem-solving and digital tracking to improve manufacturing efficiency and reduce waste.

5.4.2.3. Cross-case analysis on technology and knowledge management

Across clusters, participants described technology and knowledge systems as capabilities that enable organisations to sense, learn, and adapt. Participants linked digitalisation to data-driven decision-making, accountability, and even real-time learning. In Construction and Building Materials, it supported operational efficiency and data-led accountability.

In Consumer Goods and FMCG, technology was positioning more as an operational efficiency tool. Knowledge transfer occurred informally, while capability continuity challenged staff turnover. Retail and Pharmaceuticals participants used digital systems as learning tools to embed continuous improvement, while Papermaking and Recycling Services participants highlighted contextual adaptation and inter-organisational collaboration. Despite different levels of technological maturity, all clusters viewed digital systems as vital for translating sustainability strategies into measurable, learnable practices. Overall, technology was understood as an evolving organisational capability which links knowledge creation, operational intelligence, and continuous improvement to strategic resilience and innovation readiness.

5.4.2.4. Conclusion of the analysis of technology and knowledge management

This analysis revealed that technology and knowledge management strengthen how organisations operationalise sustainability through capability building. Across cases, participants described technology not just as a mere tool but as an organisational capability that embeds sustainability into core processes, supports data visibility, as well as foster collaborative learning. There was a consistent use of digital tracking, performance dashboards, and communication systems which reflects an evidence-based sustainability governance approach.

In the Construction and Building Materials cluster, technology helped organisations embed data transparency and performance accountability through real-time monitoring. In the Consumer Goods and FMCG cluster, technology use was largely practical, and efficiency driven. Participants relied on machinery optimisation and pilot-testing new technologies, even though they noted gaps in knowledge retention when sustainability experience left the organisation. Similarly, Retail and Pharmaceuticals, digital dashboards supported cross-functional learning as well as strategic coordination. The Papermaking and Recycling Services cluster highlighted adaptive use of technology and knowledge sharing despite infrastructure and resource constraints, which reflects turning limitations into innovation through collaboration.

The findings suggest that sustainable transformation relies on aligning technology strategy with human and institutional learning systems. Organisations that treat technology as a learning platform and a process capability could build stronger adaptive capacity, fostering innovation beyond compliance. This points to how, if knowledge sharing ecosystems are embedded within organisations, a critical pathway toward long-term sustainability integration and competitive advantage can be created for the benefit of the organisations.

5.4.3. Theme 9: Research and development

5.4.3.1. Evidence of research and development

Table 13: Evidence of research and development

P5: *"So our company's drive is obviously from a it begins from a financial perspective, so looking at what is feasible for the operations in terms of driving sustainability while still remaining profitable" 3:5 ¶ 12 in Participant 3_Clean.docx*

"It requires insight to ensure that whilst we are developing stalled, and yes, there might be new technology available. There also are still limits to what is economically viable" 3:11 ¶ 51 – 52 in Participant 3_Clean.docx *"Most businesses start off small, and you develop the ability in order to become that Rolls Royce, and you need to ensure that there's that funding, and that's why it's important to plan towards the sustainability of the business whilst you are in the development, developmental phase, and ensuring that at one point you can get to there, so you can't find a whole shebang solution, and say, all of these I need to drive as a whole within the company, and which is why you'll you would have heard me say earlier I talked about the roadmap, and we have a roadmap where we implement things on a phased basis" 3:10 ¶ 54 – 55 in Participant 3_Clean.docx*
P5: *"We share information willingly and eagerly so to ensure that the research and development from the government side proceeds. I think those are the specific examples that I can give currently, okay, there's also a lot of biodiversity opportunities." 4:70 ¶ 44 in Participant 4_Clean.docx* *"There are worldwide forums that we are members of as well that make sure that we are equipped with the latest innovation and so forth. There is exposure to other cement plants around the world as well, we are planning to construct a new state of the art green cement plant. Through a collaboration with [Partner 1], which is a Chinese company and the leading company in innovation when it comes to cement making." 4:83 ¶ 56 in Participant 4_Clean.docx* *"Through market analysis, and we do market surveys as well to consumer surveys to understand what is it that our customers are looking for, and what, how do they apply? What do they use our products for on an annual basis? We try to understand the market dynamics through that and then come up with and it goes" 4:87 ¶ 69 in Participant 4_Clean.docx*
P5: *"Our approach is quite simple. We operationalise sustainability, so it's part of the broader strategy, right? We see it as something that you need to integrate within your processes, right? Not a stand-alone department that looks at its own things that's there and that just eats up the budget without any clear direction." 7:92 ¶ 11 in Participant 7_Clean.docx* *"Mean we commissioned a new automated feeding system last year in November, which is faster, safer and which is more cost effective in terms of how much electricity it uses and so forth, and it doesn't need too much manual intervention" 7:21 ¶ 23 in Participant 7_Clean.docx*
P5: *"But if you also went to a market that's willing to accept the green product that you're bringing out, yes, it's an external factor, but it also impacts your internal strategy on how you are focusing on prioritising that" 9:18 ¶ 17 in Participant 9_Clean.docx* *"We go out there and where we supposed to be consuming, a raw material, Vir material, mind. We look for an alternative, and that can be a waste material. We bring in circular economy and waste into a feedstock in our products. So basically, that that is said in a way that it becomes our objectives are KPIs to say, what is your circular we call it the circularity rate. Okay, so which means, when the department is production, department is consuming material, they know that they need to prioritise alternative, what we call alternative material, but that is waste material, because they have an KPI that's called circularity rate. So, they need to meet that KPI. So KPIs are for departments, for individuals need to be aligned with the sustainability goal." 9:48 ¶ 43 in Participant 9_Clean.docx*

P5: *"We do it in house, actually, so we've got a full research and development team and a workshop that builds machines. So we would buy a base machine, and then retrofit it to be able to handle recycled material" 1:13 ¶ 25 in Participant 1_Clean.docx* *"[R&D] primarily focused on machine building and making the machines run faster, making them produce their scrap. But we also go and scope new product categories." 1:51 ¶ 31 in Participant 1_Clean.docx* *"I mean, the case of inks, water-based inks are difficult to work with, but we've got it down pat now, and we've got a water-based ink which we use. It takes the solvents out. But that's better for the world, yes, but we found all these other advantages to these things that we didn't think about, right? So, when you use a normal ink to print on a bag, you've got a solvent." 1:8 ¶ 73 in Participant 1_Clean.docx* *"But we found all these other advantages to these things that we didn't think about, right? So, when you use a normal ink to print on a bag, you've got a solvent. There's a fire hazard, right? And there's an odour to it. All of that is not gone because we're using all of those things. So, there's all these little benefits, um, it's better for the world, yes, but there's all these benefits that we didn't think about, because there's no fire hazard. Your insurance comes down. So, there's all these small knock-on advantages." 1:76 ¶ 73 in Participant 1_Clean.docx*
P5: *"So, we spent a lot of time looking for solutions for that, and we are very fortunate that in that we found a solution where we could take that waste and instead of dumping it to landfill, and we took it to compost to produce compost." 12:14 ¶ 25 in Participant 12_Clean.docx* *"And the beauty part about that is because landfill charges a disposal fee, so moving that to composting has resulted in the region of about, if I remember correctly, I think, for the three plants that we [saved], around about R3 million" 12:15 ¶ 25 in Participant 12_Clean.docx*
P5: *"But one thing that the companies implemented is installing the solar panels on sites on different sides, not all of them, but some of them. So, you can imagine how expensive that process is. We've only installed to eight of our sites" 13:22 ¶ 43 in Participant 13_Clean.docx* *"Some of the things that we pilot, you don't even see them as a consumer, because they don't pass that critical stage. And you find that whatever that we are piloting is environmental friendly. It can be recyclable, even the ingredients are simple to source, or they are sourced locally. But if it doesn't pass that critical stage, the business doesn't want to invest in it anymore, because it doesn't make financial sense." 13:35 ¶ 55 in Participant 13_Clean.docx*
P5: *"So, if you go to our stores, you will find that we've got what we call in-house branded products. Those store branded products we hold the intellectual property, sit with us. We take that, we now give it to them, third party manufacturers, and say, manufacture this product for us, because we don't manufacture right? But it's our in-house branded product. Now we specify what sort of oil you must use from what resources might be, what sort of packaging you must use from what So if, for example, if you buy paper, it must be approved by a specific standard, which means you are buying paper from a forest that regenerates, not forest that is actually degenerating." 5:101 ¶ 41 in Participant 5_Clean.docx*
P5: *"It's a mix of things. We don't have a pure overarching R&D structure, because that sits with the businesses" 6:58 ¶ 59 in Participant 6_Clean.docx*

"We work collectively across the so my team centrally works. And depending on what type of innovation we're looking at, sometimes we lead, sometimes we follow, sometimes we might prompt" 6:59 ¶ 59 in Participant 6_Clean.docx *"Because the food business a huge business, the fashion business is a huge business within themselves, they would have central innovation and then a distributed function as it goes, as this goes down in the data level, the group we support and assist and sometimes innovate and push down, but in the main agenda, lists in the in the areas." 6:61 ¶ 59 in Participant 6_Clean.docx* *"And so we went and innovated, and we created a new product, and we went through huge iterations of design testing, where to send it to CSIR, etc. For various testing, we eventually had to work with our partners to bring in new machinery, and because of the new design and whole new way of working" 6:68 ¶ 65 in Participant 6_Clean.docx*
P5: *"Within that we have department heads from different departments, our property team, our supply chain, our what else marketing. So different people from different departments sit in on that, and they all influence sustainability in the business in some way or another." 8:44 ¶ 28 in Participant 8_Clean.docx* *"And the clothing team has an amazing leader, and sustainability is what [they] want for [their] stores, clothing stores, and [they are] implementing that regardless of the demand or not." 8:67 ¶ 42 in Participant 8_Clean.docx* *"So, it's something like, let's convert all of our T shirts to sustainably sourced. Okay, let's go to our suppliers who can offer this" 8:69 ¶ 42 in Participant 8_Clean.docx*
P5: *"I wouldn't say we have, like a sort of a dedicated department of research and development. We it's mostly based on what is of interest to us as an organisation, right so it's internally informed and internally developed based on the interest, but mostly they the research aspect of it is also informed by, for example, right now we. Also looking into conducting research in terms of alternatives in a multilayer packaging industry" 14:58 ¶ 55 in Participant 14_Clean.docx*
P5: *"So, it's not, it's not a new team. We're using existing skills. Obviously, we'll bring in a couple extra heads for the admin part, because if my job is to run a boiler, I'm not going to spend half my days just collecting numbers about running the boiler" 15:46 ¶ 59 in Participant 15_Clean.docx* *"We know what technologies are out there, the task then becomes filtering that entire mill of stuff that's available to what works for us, what works for our budget, books, what were our targets that we've set" 15:54 ¶ 59 in Participant 15_Clean.docx*

5.4.3.2. In-case analysis of evidence of research and development

Cluster 1: Construction and Building Materials (P3, P4, P7, P9)

Participants in this cluster agreed that R&D should balance cost, efficiency and environmental goals. Overall the was agreement in R&D being essential for improving efficiency and driving sustainability. Participant 7 described that sustainability should be part of daily work and not a separate activity. They mentioned introducing automated systems that improve speed, safety and energy use, showing eco-design in production processes. Participant 4 described actively sharing information and collaborating with

government to advance research and development, especially in areas like water management and biodiversity. They also highlighted their internal approach to innovation and benchmarking, which includes annual market analysis, developing fit-for-purpose products in response to customer needs, and partnering with international industry leaders to continuously adopt best practices.

Participant 9 shared that developing greener materials and product design helps us meet customer expectations. Their view was more market and customer-driven, unlike Participant 7's operations focus. Participant 3 explained that technology upgrades must make financial sense, stressing the importance of maintaining both profitability and long-term business sustainability. They explained that regulatory demands and cost pressures, alongside market realities and resource limitations, significantly influence the extent and pace of technological innovation within the organisation.

Cluster 2 - Consumer Goods and FMCG (P1, P12, P13)

In this cluster, it was Participant 1 who was most vocal about the role R&D plays within their organisation towards GI. They highlighted the strong connection between R&D and operational efficiency, explaining how their teams adapt and develop machinery as well as explore improvements in product design and packaging for better recyclability. They also described the continuous refinement of processes and formulations - not just to comply with regulations but to advance sustainability and efficiency - while ensuring that product performance is not compromised.

Participant 12 described R&D as an informal, practical process embedded in daily operations. they that explained the only way to survive in a low-margin business is to integrate sustainability into procurement. They mentioned it focused on experimenting with solutions to operational challenges and collaborating closely with suppliers, rather than relying on a formal, dedicated research department. Conversely, Participant 13 described that the organisation's R&D is mostly limited to small pilot projects rather than large-scale innovation. They explained that financial constraints and a need for clear business cases often prevent these pilots from scaling up or becoming strategic priorities within their organisation.

Cluster 3 - Retail and Pharmaceuticals (P5, P6, P8, P11)

On the matter of R&D, these participants were similar in valuing partnerships and collaborative and practical problem-solving. Participant 5 did not explicitly discuss R&D activities. Instead, they focused on innovation in product design, setting sustainability

standards with suppliers, and continuous improvement through audits and compliance. They shared that innovation and sustainability are embedded by design in both products and operational processes.

Participant 6 explained that innovation in their organisation is not a separate lab activity but embedded in how projects are planned and executed, with every new initiative assessed for efficiency and sustainability gains. They added that technology teams, production, and quality all have to sit together, emphasising collaborative R&D and internal testing as integral to compliance, performance, and continuous improvement.

Participant 8 highlighted that R&D was driven by the different cross-functional teams focusing on specific green initiatives that were relevant to their departmental deliverables. Each team pursues green initiatives linked to their specific operational challenges, such as sustainable sourcing in the clothing department. What was different is in this cluster is that Participant 11 did not mention research and development as a focus within their organisation.

Cluster 4 - Papermaking and Recycling Services (P10, P14, P15)

In the Papermaking and Recycling Services cluster, R&D was viewed as essential to achieving green goals but shaped by organisational capacity. Participant 14 noted that their organisation's research and development is guided by internal interests and evolving market needs, rather than by a dedicated R&D department. They emphasised that this approach enables targeted research into sustainable alternatives, such as innovative packaging solutions.

In contrast, Participant 15 described their R&D as an informal, learning by doing process. This is because it is driven through practical experience, internal testing, and a focus on improving efficiency and reducing waste with available resources, rather than through a formalised R&D program. Participant 10 did not speak about internal research and development initiatives or structures.

5.4.3.3. Cross-case analysis of evidence of research and development

Across all clusters, a shared view among participants was that R&D helped organisations to improve efficiency and embed sustainability into daily practice. It was understood not as a separate technical function but as a capability embedded within organisational routines. In the Construction and Building Materials cluster, R&D was framed as operationally embedded in their everyday processes and geared towards improving cost,

speed, and environmental performance. Participants emphasised technology upgrades and learning from global practices while balancing innovation with the financial constraints. In the Consumer Goods and FMCG cluster, R&D was mixed in maturity and commercially oriented. Participant 1 associated it with recyclability and performance improvement, while others focused on cost efficiency, pilot testing and improving processes within financial limits.

Within Retail and Pharmaceuticals cluster, R&D operated through cross-functional collaboration and partnerships. Participants described integrated experimentation, where project teams drove innovation and continuous testing across the different departments. In the Papermaking and Recycling Services cluster, participants highlighted adaptive R&D that was shaped by structural limits and their resource realities. Here, innovation was more about learning by doing.

5.4.3.4. Conclusion of the analysis of evidence on research and development

A review of the evidence revealed that organisations across all clusters are investing in research and development (R&D) as a key pathway to sustainability and innovation. Even though the degree to which they do this is different. What is similar is that across clusters, R&D was not a standalone technical activity but embedded in everyday processes, connecting operational efficiency, cost optimisation, as well as environmental responsibility.

In the Construction and Building Materials cluster, R&D reflected incremental improvement through technology adaptation and global learning. The Consumer Goods and FMCG cluster emphasised structured R&D aligned with product efficiency and circular innovation. Within the Retail and Pharmaceuticals cluster, R&D was mostly embedded in project planning and internal testing with some emphasis on supplier collaboration. The Papermaking and Recycling Services cluster revealed both formal and informal approaches to R&D. Some participants described targeted research priorities that are aligned to sustainability goals, while others described learning by doing and problem-solving with limited resources.

5.5. RQ3: Organisational resources and capabilities for GI

In the following section, themes that are related to the research question about what ways do the development and deployment of ORs enable companies to reconceive their

products and markets for sustainability will be discussed. The table below illustrates the themes and subthemes which emerged from analysing data for RQ3.

Table 14: Themes and subthemes for deploying resources for GI

Construct	Theme	Subtheme
Organisational resources	External partnership collaboration	○ Partnerships for capacity building ○ Industry alliances and cross-sector collaboration ○ Supplier co-development and inclusive innovation ○ Global and market-driven partnerships
	Brand positioning	○ Educating and engaging the conscious consumer ○ Building trust and enabling sustainable consumer choices

5.5.1. Theme 10: External partnership collaboration

5.5.1.1. Evidence of external partnership collaboration

Table 15: Evidence of external partnership collaboration for GI

P3: *"We take part within the Green Building Councils Presentations each year, and we part of those discussions there. And you constantly find where people just think that while cement purely is non-sustainable, and whilst it is a product that originates from mining, the sustainability can be so much more than just whilst we are mining, we can take away from a waste resource, from the electrical generating companies, you know, utilising fly ash as an extender, utilising slag from the metallurgical industries as part of extenders of manufacturing."* *3:37 ¶ 73 in Participant 3_Clean.docx*
P4: *"There are worldwide forums that we are members of as well that make sure that we are equipped with the latest innovation and so forth. There is exposure to other cement plants around the world as well, we are planning to construct a new state of the art green cement plant."* *4:81 ¶ 56 in Participant 4_Clean.docx* *"I think it's exposure, it's collaboration with industry players that know exactly what they are doing in South Africa. We have a lot of collaboration with other cement players as well and understand what they are doing in this space."* *4:84 ¶ 56 in Participant 4_Clean.docx*
P7: *"We go to the market and we look at industry partners in the country and try and establish, what are they doing, what have they done, and what are they what? What are their commitments? And then we approach what we call our partners, because you like I say, and I keep repeating it, because collaboration is the name of the game when it comes to sustainability. So you will approach government if needs be, like with our waste tyres"* *7:37 ¶ 31 in Participant 7_Clean.docx*
P1: *"So, they'd gone to the industry and said, we want [product type 1] made out of recycled material. And the industry said to [Retailer 1], it's impossible. It cannot be done. We said, well, we'll turn our attention to it, and lo and behold, we started making [product type 1] out of recycled material. And if you now look at the plastic*

industry in South Africa, they're all made out of recycled material." 1:55 ¶ 31 in Participant 1_Clean.docx *"So, we had to go to the buyback centres and say, Guys, we need you to start collecting high density polyethylene, that's the grade of material that we use to make [product type 1]. And they go, no, we don't do it. We need. Start buying it, because I need 300 tons of recycled high density polyethylene per month. And our suppliers cultivated the stream."* 1:26 ¶ 53 in Participant 1_Clean.docx
P12: *"So, we spent a lot of time looking for solutions for that, and we are very fortunate that in that we found a solution where we could take that waste and instead of dumping it to landfill, and we took it to compost to produce compost."* 12:14 ¶ 25 in Participant 12_Clean.docx
P13: *"We also partnered with other small SMMEs. So, they take some of our waste from the site or from the plant and process it into something that will benefit them and also create jobs in the long run"* 13:17 ¶ 37 in Participant 13_Clean.docx
P5: *"We go to our suppliers, and we build in ESG requirements into the audit tool, so they also check ESG so terms like environmental, how that product is manufactured, how the waste is managed, how the resources are managed."* 5:54 ¶ 47 in Participant 5_Clean.docx *"We actually rent our stores from the landlords. Long term, we actually have to go to the landlords and, say, landlords, we've got 2050, ambition. How do we go about it? How do we support you to make sure that you install solar, you will be green power so that we can achieve that."* 5:85 ¶ 73 in Participant 5_Clean.docx
P6: *"We have partners in various forms. We have, you know, if we are talking about suppliers, then certainly we, we work with suppliers as far as possible who match our ambitions and our ethos."* 6:25 ¶ 35 in Participant 6_Clean.docx *"So, what we will be clear that we can achieve anything we want to achieve on our own, then it's essential that we work with others, that we engage in collective action, that we work with partnerships."* 6:27 ¶ 35 in Participant 6_Clean.docx *"And we work with organisations where we can, if we have ambitions in certain areas, where global or local organisations which can support us in understanding that upskill ourselves, bring the knowledge into the organisation, etc."* 6:28 ¶ 35 in Participant 6_Clean.docx
P3: *"We also have partnerships outside of PROs, like [organisation name] and this is obviously a paid partnership that we subscribe to, and through that we get, obviously advice as to how we improve our supply chain, but they also connect us with other experts in the field"* 8:58 ¶ 30 in Participant 8_Clean.docx *"We also often are signatories to a bunch of things, which means we have access to workshops and, yeah, even the in the retail space, there's something called the Brand Forum, which has also been helpful with because it's a platform or forum for bunch of retailers or brand owners that we can share and discuss information"* 8:62 ¶ 30 in Participant 8_Clean.docx
P3: *"So for example, there's platforms like [platform name] that actually complete an assessment, an ESG assessment, about the things that your company is doing from a strategy governance perspective, and it gives you a rating, like you're a gold medal, silver medal, but then you do that for your suppliers, and you then get a visibility into the sustainability performance of your supply base"* 11:41 ¶ 41 in Participant 11_Clean.docx

"But from an innovation perspective, I think in China, we have a strong relationship from a manufacturing perspective for sharing innovation from manufacturing perspective with our Chinese counterparts. So how that then interprets into Africa? Again, our capacity building and capability building is that we've, in the past, developed the state of the class manufacturing facility" 11:49 ¶ 47 in Participant 11_Clean.docx
P10: *"They also got what we call smart farming techniques, which they implement. So also, for the environment, and on the other hand, is manufacturing." 10:11 ¶ 11 in Participant 10_Clean.docx* *"Manufacturing brick plants that uses fly ash. Why it's less energy intensive, it's environmentally friendly. It doesn't consume a lot of water." 10:12 ¶ 11 in Participant 10_Clean.docx*
P14: *"They represent industries at a national level. They are sort of a member-based organisation that has a lot of corporate companies." 14:15 ¶ 25 in Participant 14_Clean.docx* *"The collaboration is also based on the principle of consensus. So, there is consensus building platforms where companies come together and have a common vision, have a common understanding that we need to phase out this because it doesn't align with the principle of circular economy" 14:16 ¶ 25 in Participant 14_Clean.docx*
P15: *"So, we hire an independent auditing team to come and audit our systems and our numbers" 15:14 ¶ 11 in Participant 15_Clean.docx* *"We have all the technical expertise, and if we don't have it, we buy it in consult with people. We know what technologies are out there, the task then becomes filtering that entire mall of stuff that's available to what works for us, what works for our budget, books, what were our targets that we've set?" 15:61 ¶ 59 in Participant 15_Clean.docx*

5.5.1.2. In-case analysis of evidence for external partnership collaboration

Cluster 1: Construction and Building Materials (Participants 3, 4, 7, 9)

Participants in the construction and building materials cluster described external partnerships as essential for driving product innovation and aligning national practices with international sustainability expectations. Participant 3 highlighted participation in external collaborative partnerships through engagement with industry bodies like the Green Building Council and by integrating byproducts, like fly ash, from other industries into their processes. These efforts support the organisation's broader sustainability goals and knowledge exchange. Similarly, Participant 4 emphasised expert and industry leader collaboration *and* exposure to international industry players, highlighting how engagement with global peers stimulated benchmarking and technology considerations.

Participant 7 emphasised that external collaborative partnerships are important to advancing sustainability. They described how their organisation actively engaged with

industry peers to adopt best practices, collaborates with government entities for project implementation and compliance, and that they sought seeks input from specialised agencies. They highlighted that forming these partnerships accelerated innovation and enhanced their capacity to meet ambitious sustainability goals. Participant 9 did not speak about external collaborative partnerships.

Cluster 2: Consumer Goods and FMCG (Participants 1, 12, 13)

Participants in this cluster described GI as a market- and consumer-driven process embedded in collaborative networks. Participant 1 emphasised supplier co-development because business ethos influenced product development, industry collaboration exploration, and product development as a sustainability drive. This view linked product differentiation to environmental responsibility, positioning sustainability as a brand advantage rather than a compliance obligation. Participant 1's emphasis on strong brands and international customer exports, underscored that sustainability was not something on the sidelines organisations can ignore, but increasingly core to competitiveness in global markets.

Participant 12 reinforced the collaborative side of innovation by describing partnerships with suppliers and waste contractors to convert hatchery waste into compost in an effort to save costs and reduce landfill use. They noted that that they have built relationships that make sustainability practical, that to them, it was about the shared benefit amongst their suppliers.

What was different is that Participant 13 spoke about working with external partners to test new materials and reduce packaging waste. They explained that these partnerships help their organisation try new ideas and learn what works in practice.

Cluster 3: Retail and Pharmaceuticals (Participants 5, 6, 8, 11)

Participants in the retail and pharmaceuticals cluster shared a view that partnerships were catalysts for both innovation and accountability, that partnerships and market influence shaped their approach to GI.

Participant 5 addresses external collaborative partnerships primarily with third-party manufacturers and suppliers. They describe they did this by setting detailed sustainability and quality standards and conducting regular compliance audits. They also highlighted collaboration with landlords to support net-zero ambitions through initiatives like solar installations. Similarly, Participant 6 described working with a wide range of partners -

including suppliers, environmental agencies, and organisations that support ethical sourcing and environmental standards. These collaborations are important for bringing in expertise, upskilling internal teams, and taking collective action. What was different to what the others addressed in this cluster is that Participant 6 stressed the need to align with partners who share the organisation's values and to engage globally and locally for ongoing improvement and innovation.

Participant 8 described partnering with PROs to drive packaging innovation and share responsibility for recycling. They also highlighted alliances with environmental agencies and participation in industry forums, which enable access to technical expertise, fresh ideas, and shared best practices. This enables access to resources the company might not have developed on its own due to capacity or skill limitations. What is different is Participant 11 described partnerships with global customers who push higher sustainability standards and share programmatic resources. They also highlighted collaboration with industry bodies for supply chain audits and knowledge transfer, as well as sharing manufacturing innovations with counterparts in Asia.

Cluster 4: Papermaking and Recycling Services (Participants 10, 14, 15)

Participants in the papermaking and recycling services cluster described a cohesive picture of a cluster where sustainability depended on collaborative partnerships and local engagement. Participant 10 emphasised community partnerships *and* smart farming techniques. Their examples reflected a sustainability approach grounded in community participation and shared benefit. Similarly, Participant 14 did not get into great details about external collaborative partnerships. They did however describe the integration of multiple stakeholders and the role of member-based organisations such as Producer Responsibility Organisations (PROs) in enabling progress. They highlighted how national and international commitments and municipal collaboration created opportunities for the sector to align on environmental and economic objectives.

Participant 15 described external collaborative partnerships more for reporting purposes for auditing. They highlighted consulting with outside experts when in-house expertise is lacking.

5.5.1.3. Cross-case analysis of evidence for external partnership collaboration

Across clusters, external partnerships emerged as important in advancing GI. In the Construction and Building Materials cluster, participants highlighted collaboration with global peers and government as key to aligning local practices with international

sustainability goals. These partnerships not only informed technology adoption but also shaped policy awareness and capability-building within the cluster.

Consumer Goods and FMCG participants described partnerships as value-driven, linking supplier collaboration and product co-development to practical delivery for sustainability and for some, competitive positioning. Retail and pharmaceuticals participants positioned partnerships as ways for knowledge exchange and accountability, supporting compliance and innovation goals. The Papermaking and Recycling Services participants extended the partnership narrative to include community integration, demonstrating how multi-stakeholder coordination underpinned GI efforts. Unlike other clusters, they showed some ties between environmental and social outcomes through local participation.

5.5.1.4. Conclusion of the analysis of evidence for external partnership collaboration

This analysis explored how external partnerships shaped the development of GI across industries. The Construction and Building Materials cluster underscored global benchmarking and government collaboration as mechanisms for aligning local capacity with international standards. The Consumer Goods and FMCG cluster positioned partnerships as market-driven, linking supplier co-development to practical sustainability delivery. Retail and Pharmaceuticals participants highlighted partnerships as key in sharing learning and transferring knowledge, while the Papermaking and Recycling Services cluster revealed how multi-stakeholder coordination supported environmental objectives.

These insights demonstrate that partnerships are not peripheral but foundational to embedding sustainability into organisational strategy. They reveal that the most effective innovation happens where partnerships bridge technical expertise and community action, this is no different in the case of GI in advancing sustainability. Partnership quality determines the depth and durability of GI outcomes. Organisations that invest in purposeful and collaborative partnerships are better positioned to enhance their competitiveness and access new markets.

5.5.2. Theme 11: Brand positioning

5.5.2.1. Evidence of brand positioning

Table 16: Evidence of brand positioning for GI

P3: *"But you need to be able to manage the expectations of the market outside there as well. Whilst the stone can serve the same purpose, they don't necessarily have the same. How can you call, it's like appeal to the customer. Okay, the customers. So, for instance, I can manufacture you a cement that's pink, but how much? How many, how many pink cements? Do you know that's out there?" 3:19 ¶ 12 in Participant 3_Clean.docx* *"You know, you can be quite surprised that just how sensitive people get at the colour that changes when it structurally it makes no difference, but the colour does play a difference, and all of that needs to find a balance to the point where you can optimally use your resource, while sometimes you need to change the mindset of the customer, and other times you need to be able to utilise the resource to such point where the impact shift is not perceived by the customer." 3:38 ¶ 14 in Participant 3_Clean.docx*
P4: *"Apart from it just being a portfolio, is it has with on the customer base, it has to do a lot with brand, brand education and so forth." 4:72 ¶ 50 in Participant 4_Clean.docx* *"I'll put it simply, we have high strength cement, and then you have low strength cement that you can use for different purposes. Traditionally, people will probably say, the higher the strength, the better. So, they will use it for bricks. They will use it for foundation. They will use it for plastering. They will use it for everything which is not necessary." 4:74 ¶ 50 in Participant 4_Clean.docx*
P9: *"But then also, yeah, market, how market receives you, how market receives the product that you are bringing out. I am at a plant where currently, or at a company where currently, we are supplying two markets, and one market is saying the government where we are supplying is not supporting, you know, Green Innovation. And because of that, the market is also not going that route. So, when you bring products to them, they actually resisting and saying, this is not what we know we want the original product, whether it's green or not. We don't care." 9:24 ¶ 19 in Participant 9_Clean.docx*
P1: *"Our ethos is better for the planet. So, whatever we do, whatever product we get involved with, has to be better than its peer set." 1:34 ¶ 13 in Participant 1_Clean.docx* *"Sustainability goes hand in hand with our value proposition" 1:2 ¶ 5 in Participant 1_Clean.docx* *"That steps into the world of what our actual brand underpinning is. Our hero product is [our product type 2]. And our [our product type 2] are made from 100% recycled material number one. But of that 100% recycled material, 75% is post-consumer waste." 1:31 ¶ 7 in Participant 1_Clean.docx* *"What we're doing is a good thing, which is why we've, as I said, it's our it's our whole, it's our whole reason to believe, right? Why we do the inks and the closed water and the master batches that are made of recycled tires, those are all things that we've developed over time, because we've, we've grown to really believe it." 1:93 ¶ 73 in Participant 1_Clean.docx*
P13: *"And obviously, because we are big in Africa, we have to stand out and play our part" 13:13 ¶ 31 in Participant 13_Clean.docx*

"Some of these products, they're just testing them to see how the market responds, just a pilot. So, if the market responds very well, and then they'll continue with it" 13:25 ¶ 45 in Participant 13_Clean.docx *"Another thing is that they are always benchmarking against our competition" 13:75 ¶ 53 in Participant 13_Clean.docx*
P5: *"And we not just going to go and put in solar because we want to look good in the papers, but we'll put in solar because it's a strategic lever for us to get us to a specific point. We will go and put in green initiatives, not for just for the good of it. Well, it's the right thing to do, but we will make it in line with our long-term strategic goal" 5:8 ¶ 13 in Participant 5_Clean.docx* *"See, green initiatives from a customer perspective, are driven by the customer's need." 5:44 ¶ 35 in Participant 5_Clean.docx* *"We're talking more around customer centricity. How do we provide a product that is safe to our customers? How do we provide a service that is safe to approach our customers" 5:70 ¶ 61 in Participant 5_Clean.docx*
P6: *"Sustainability is very much key to the world with a brand and identity and ethos" 6:1 ¶ 11 in Participant 6_Clean.docx* *"We want to run a business with certain values and in a certain way and we want to treat people well and treat customers well, employees, well, communities, well. We want to, you know, products need to be innovative, to include the environment, well, etc. So based on that basis, the approach and the way the business operates, has this at its at its heart." 6:144 ¶ 11 in Participant 6_Clean.docx* *"There was a time where we would send a monthly email just about packaging around, about water, about energy. What we're doing in animal welfare, we tend to integrate it a bit more in our communication now, but one of the biggest things, firstly is communicating" 6:89 ¶ 93 in Participant 6_Clean.docx* *"We've had, take back schemes in store for things we so our approach to working with customers is varied. It's multiple, it's ongoing, it's evolving. And we want to ensure that we work with customers to meet the expectations and we and to inform and guide them, as well as to what to where we are going and why we make the choices that we do" 6:96 ¶ 95 in Participant 6_Clean.docx*
P8: *"We want to maintain our reputation of being a good retailer" 8:29 ¶ 21 in Participant 8_Clean.docx* *"And then, in terms of marketing, is it necessary to market? Is it worth putting your money towards marketing it if you'd rather spend your money on the innovation itself? Or would you benefit from the marketing to and that could go towards future innovations?" 8:79 ¶ 48 in Participant 8_Clean.docx* *"So, we have a quite a range of customers, some people who are interested in sustainability or environmental impact. And some people who this is not a priority for them, and understandably so, you need to feed your family, and that's first priority. So, we have a small range of customers who will who are interested and keep us on track and will continue to follow our progress." 8:37 ¶ 21 – 22 in Participant 8_Clean.docx*
P15: *"We are in a space where, you know, customers are looking for how green is this product" 15:22 ¶ 23 in Participant 15_Clean.docx*

"If you look at what the Europeans are signed up for, there's like, six, 700 things that you can sign up for. And it makes you look good in in the eyes of your customer."
15:57 ¶ 65 in Participant 15_Clean.docx

5.5.2.2. In-case analysis of evidence of brand positioning

Cluster 1: Construction and Building Materials (Participants 3, 4, 7, 9)
Participants in this cluster described sustainability awareness and brand positioning as key influences on how consumers respond to green products. Participant 3 noted that adapting sustainable products often require educating customers or subtly managing changes, so they go unnoticed. The company balances innovation with market demands by modifying products and gently shifting customer mindsets toward sustainability.

Participant 4 described that customer education and brand communication are important for shaping perceptions of green products, explaining that many consumers are accustomed to traditional product choices and require guidance on selecting the most suitable and sustainable options. Participant 9 highlighted that while interest and awareness around sustainability and green products are increasing, some customers still prefer products that are familiar to them and affordable, which leads to resistance to new green products – showing a difference between awareness and actual purchasing behaviour.

Cluster 2: Consumer Goods and FMCG (Participants 1, 12, 13)
Participants in this cluster discussed sustainability mainly in relation to consumer awareness and acceptance. Participant 1 described how consumer perception has evolved from scepticism to increasing demand for recycled products, while also noting that price sensitivity in the market persists. They positioned their brand as a pioneering leader in sustainability, emphasising that GI distinguished them within the industry. Furthermore, they articulated a brand identity firmly rooted in authentic commitment to sustainability, with responsible practices that have been integrated into organisational culture.

Participant 13 emphasised that new green products are piloted to see how consumers respond, and only successful products move forward, showing that consumer perception is crucial to product decisions. They also noted their organisation is constantly benchmarked against global competitors and faces unique scrutiny as a leading brand in Africa, highlighting the importance of maintaining market position. What is different is

that Participant 12 did not speak about customer perceptions or acceptance or brand positioning.

Cluster 3: Retail and Pharmaceuticals (Participants 5, 6, 8, 11)

In the Retail and Pharmaceuticals cluster, participants discussed sustainability mainly in terms of consumer awareness, behavioural change, and market readiness. The cluster suggests that improving market education and convenience remains important to encouraging sustainable consumer choices and strengthening brand credibility. Participant 5 described how authentic sustainability efforts support brand reputation and are only pursued if they make long-term business sense. They highlighted tailoring green products to meet diverse customer preferences, reinforcing a customer-centric brand image. Furthermore, protecting product quality, consumer safety, and company reputation were emphasised as central to building trust and positive perception.

Participant 6 was the most vocal within this cluster and explained that sustainability is integral to their brand positioning, reputation, and image. They described it as key to the brand and identity and ethos of the organisation. They emphasised that responsible and innovative practices are central to both internal values and public perception - aiming for their business to be seen as ethical and innovative. Furthermore, they discussed how green marketing and consumer communication have evolved, from dedicated sustainability emails to more integrated messaging, ensuring customers are informed and can trust the brand's ethical sourcing and product quality. Consumer perception is shaped not just by explicit marketing, but also by in-store innovations and labelling that help customers make responsible choices.

Participant 8 described their organisation's brand as grounded in the principle of doing good as good business, with an ongoing emphasis on upholding a positive reputation and ethical image. They explained that green marketing is approached strategically, often prioritising actual sustainability initiatives over promotional efforts due to varying consumer interest. Furthermore, they highlighted that they have seen that their consumer perception is diverse, noting that while a segment may value sustainability, affordability remains the primary concern for many of their customers – which affects how green initiatives are communicated by the organisation. What is different is that Participant 11 did not speak about customer perceptions or acceptance or brand positioning.

Cluster 4: Papermaking and Recycling Services (Participants 10, 14, 15)

In this cluster, only Participant 15 spoke about brand positioning. They explained that customer perceptions and expectations for sustainability are strong drivers of their strategy. They mentioned that customers are looking for how green their products are. They also noted the marketing aspect of accumulating green certifications, remarking that these make organisations look good in the eyes of customers.

5.5.2.3. Cross-case analysis of evidence of brand positioning

Across clusters, participants described brand positioning and consumer awareness as important to how sustainability gains legitimacy in the market. In the Construction and Building Materials cluster, participants emphasised that sustainability communication should build understanding rather than promote products. They argued that teaching sustainability early and showing value clearly helps close the gap between awareness and purchasing decisions, especially where cost and familiarity still dominate consumer choices.

In the Consumer Goods and FMCG cluster, sustainability was viewed as a moral and commercial imperative. Participants noted that sustainability becomes a selling point only when consumers see the benefit, such as affordability or improved performance. However, not all participants discussed brand positioning.- which indicates varied emphasis within the cluster. Retail and Pharmaceuticals participants focused on visibility and convenience, and emphasised that showing consumers what sustainability looks like through packaging, store design, and recycling initiatives can position their brands in a positive light. They also pointed towards reputation and trust as important to brand perception. What was different is that Papermaking and Recycling Services participants only had one participant speak to this topic. The participant associated brand trust with transparency and local relevance. They stressed that people need to see organisations doing it, not just talking about it.

5.5.2.4. Conclusion of the analysis on brand positioning

In general, participants were similar in that brand positioning and consumer education are key enablers of GI. The findings show that while organisations approach sustainability communication differently, they share a belief that awareness and transparency shape how consumers and stakeholders respond to new environmental solutions. Participants agreed that awareness and trust form the foundation of how green products gain acceptance. Branding was not described as a marketing exercise but as a process of education and transparency.

Construction and Building Materials and Consumer Goods and FMCG participants viewed education as a way to conscientise people and bridge the gap between awareness and behaviour, while retail participants demonstrated how visible and convenient actions make sustainability more accessible. In the Papermaking and Recycling Services cluster, only one participant spoke about brand perception. They highlighted credibility and visible action over promotion, arguing that people need to see sustainability being practiced, not just talking about it.

These insights highlight that effective brand positioning extends beyond promotion; it builds legitimacy through transparency and consumer empowerment through education. Organisations that align genuine sustainability practice with clear and relatable communication are better positioned to build lasting consumer trust and secure a market advantage.

5.6. Conclusion

To conclude, a number of subthemes were identified from the findings. Table 15 shows a summary of these subthemes under each main theme, organised by RQ.

Table 17: Summary of subthemes identified from the findings

Research question	Constructs	Theme	Subtheme
RQ1 – What internal and external factors drive companies to develop organisational resources for sustainable green innovation?	Green innovation (drivers)	Stakeholder pressure	○ Regulatory compliance and environmental standards ○ Customer and market demand for sustainable products ○ Investor and shareholder sustainability expectations ○ Peer and industry benchmarking influence
		Leadership commitment	○ Strategic accountability and follow-through ○ Governance, oversight, and ethical decision-making ○ Integration of sustainability into organisational vision and identity
		Sustainability mindset	○ Storytelling for mindset shift ○ Behavioural resistance and change readiness ○ Purpose-driven organisational identity
		Strategic orientation	○ Strategic integration and alignment

			○ Strategic foresight and opportunity orientation ○ Business case that links sustainability to value creation
RQ1 – What internal and external factors drive companies to develop organisational resources for sustainable green innovation?	Green innovation (barriers)	Resource constraints	○ Budgetary and financial limitations ○ Cost-benefit and ROI trade-offs ○ Systemic supply chain and material dependencies ○ Operational efficiency and resource optimisation
		Integration constraints	○ Fragmented organisational integration and accountability ○ Weak cross-functional collaboration and governance cadence ○ Supplier and value chain misalignment ○ Limited organisational readiness for implementation (capacity and system readiness)
RQ2 – How do companies build and leverage organisational resources and dynamic capabilities to support green innovation initiatives?	Organisational resource	Employee skills	○ Building organisational capability and green skills infrastructure ○ Employee empowerment and ownership in sustainability
		Technology and knowledge management	○ Integrating technology and innovation for sustainable transformation ○ Knowledge sharing and organisational learning (collaborative learning ecosystems)
		Research and development	○ Embedding sustainability into product and process design ○ Adaptive and iterative innovation practices (incremental innovation) ○ Collaborative and proof-based R&D for innovation impact
RQ3 – In what ways do the development and deployment of organisational resources enable companies to reconceive their products and markets for sustainability?	Organisational resource	External partnership collaboration	○ Partnerships for capacity building ○ Industry alliances and cross-sector collaboration ○ Supplier co-development and inclusive innovation ○ Global and market-driven partnerships
		Brand positioning	○ Educating and engaging the conscious consumer ○ Building trust and enabling sustainable consumer choices

6. Chapter 6: Discussion of findings with literature

6.1. Introduction

The aim of this chapter is to explain the comparison of the findings from Chapter 5 with literature. The chapter is organised by theme, as per Chapter 5. For clarity and convenience, each section starts by briefly restating the main findings for that theme. This is then followed by a comparison to what past research has shown.

If a finding matches what other researchers have found, this is noted. If a finding is new or nuanced, that is also highlighted. In cases where a finding appeared to be new or where very little literature existed within Chapter 2, an extra check was carried out. This involved looking for more recent (within five years) additional studies to confirm whether the theme has been discussed before by other scholars, and to make sure the result is credible. While this process is not exhaustive, it does show that a systematic search was conducted to support the discussion of what may seem potentially new or differing findings.

This process helps show where the study supports existing knowledge, where it may seem to add something new, and where it may offer a different view. The chapter ends by summarising the overall conclusions for each theme and presents a final and amended version of the conceptual framework based on these findings.

To ensure that a rigorous process of comparison was done between the findings of the study and the existing literature, the researcher adopted a staged approach in reviewing the literature. This was included in order to determine whether the themes that were identified in the study were already established within academic literature or perhaps represented new contributions. This additional step was only necessary where there appeared to be something new or different, it was not required when relevant literature was already well established.

Step 1:
Revisit a selection of key article sources that have already been included in the literature of the paper, focusing only on themes that appeared potentially new or different in the findings. Specific keywords were used to search each theme. This allowed the identification of any relevant discussions that were not previously noted.

Step 2:
If a theme did not appear in the initial list of sources the researcher had, the researcher expanded the review. The expansion included leading scholars repeatedly referenced in the literature. Recent publications (within the last five years) by these experts were reviewed and searched using the same thematic keywords. When relevant literature was found, it was assessed to determine how the new findings aligned with, extended, or were different from current academic discourse. If there was no supporting literature that emerged at this stage, the process then moved to a third phase.

Step 3:
The researcher conducted targeted keyword searches related to each theme within highly regarded peer-reviewed journals in the field. If relevant literature was found, it was compared to the study's findings to see where they were similar or had a nuance of difference. When no relevant research was identified after completing all three stages of the search process, this was taken as an indication that the theme could represent a potential area of difference or a contribution not yet widely explored in the literature.

Where relevant, the specific search terms that were used for each theme are documented within the themes under discussion. Any new literature that has been identified through this method was included in the reference list and discussed only in this chapter. This was done to ensure a clear distinction between the original literature review that was completed in Chapter 2 and the literature that has been incorporated during the discussion stage.

6.2. RQ1: Drivers of green innovation

6.2.1. Theme 1: Stakeholder pressure as a driver

6.2.1.1. Recap of findings on stakeholder pressure

A review of the evidence revealed that organisations across all clusters are responding to multiple stakeholder pressures that influence and, in some instances, shape their sustainability agendas. Participants consistently referred to regulatory compliance and environmental standards influencing how strategies are formed. Organisations invest heavily in aligning operations with national policies such as carbon taxation and waste management regulations to remain competitive and compliant.

Customer and market demand for sustainable products emerged as another strong influence, particularly in Consumer Goods and FMCG and Retail and Pharmaceuticals clusters. Participants highlighted that customers now expect recyclable packaging and transparent information on product sustainability. This compels organisations to innovate in design as well as in sourcing materials and products.

Investor and shareholder sustainability expectations were also evident, where participants explained that more and more investors assess environmental performance before making funding decisions. Peer and industry benchmarking influence drove continuous improvement across clusters, with several participants explaining that global best practices serve as a reference point for local innovation. A notable nuance is that participants in the Consumer Goods and FMCG, as well as the Retail and Pharmaceuticals clusters, emphasised that organisational values and long-term brand purpose reinforce sustainability commitments, while participants in the Retail and Pharmaceuticals cluster additionally highlighted reputation and risk management as important drivers.

Overall, stakeholder pressure is an external factor that participants highlighted as a driver for GI. It would seem then, that organisations that balance compliance with market responsiveness demonstrate stronger adaptive capacity and long-term strategic alignment with global sustainability trends.

6.2.1.2. Recap of literature on stakeholder pressure

Stakeholder pressure is important in pushing organisations towards GI. Customers, regulators, competitors, shareholders, and even employees are all shaping expectations and encouraging organisations to take sustainability seriously (Xie et al., 2019; Madrid-Guijarro & Duréndez, 2023; Bhatia, 2021). However, pressure alone is not enough to create meaningful change (Song et al., 2020). Organisations need the right capabilities to act on this pressure, and this includes their ability to understand and apply new sustainability knowledge (Song et al., 2020). This highlights the importance of AC, as organisations that can take in and use information are better placed to respond to sustainability demands and turn ideas into real outcomes (Song et al., 2020). At the same time though, financial pressures and operational challenges can slow progress, especially when sustainability is seen only as a cost (Xie et al., 2019). This is why leadership commitment and investment in skills, knowledge, and internal processes remain important (Bhatia, 2021; Bhatia & Jakhar, 2021; Wiredu et al., 2024). These insights highlight how outside pressures shape how organisations build their internal

resources and capabilities that support GI, directly linking to RQ1. Overall, GI relies on both external pressure and strong internal capabilities to move from intention to practical action.

6.2.1.3. Discussion of the findings with literature on stakeholder pressure

Across all clusters are responding to different types of stakeholder pressure that shape their sustainability agendas. Regulation stands out as one of the main influences. In order to comply, organisations must meet environmental standards and follow national and international policies, including carbon taxes and waste-management laws. This means that government regulation works not only as a requirement, but also as a driver that encourages organisations to improve and innovate towards being green. This reflects the view from Madrid-Guijarro and Duréndez (2023) that environmental regulation can support innovation by pushing organisations to become more efficient. More recent studies also note that regulations continue to support sustainability-focused innovation, especially in countries that are still developing (Song et al., 2020; Khanra et al., 2022).

Alongside regulation, customer and market expectations were also seen as strong motivators, especially in the Consumer Goods and FMCG, Retail and Pharmaceuticals clusters. The findings showed that customers now want recyclable products and clear information about products. This encourages organisations to change the way they source materials and design products (Khanra et al., 2022). This finding is consistent previous research that customer expectations can speed up GI (Khanra et al., 2022; Madrid-Guijarro & Duréndez, 2023). Similarly, Madrid-Guijarro and Duréndez (2023) found that organisations that respond to customer sustainability demands can benefit in reputation and performance.

Investor pressure also played a role. The findings showed that investors are increasingly looking at environmental performance when making decisions. Similarly, Khanra et al. (2022) reason that organisations that place a strong focus on GI tend to be viewed more positively by financial analysts. This is known to help organisations look more favourable when it comes to securing long-term investment (Khanra et al., 2022). Peer and industry benchmarking also influenced organisations, which supports the view that when competitors adopt green approaches for their organisations, others in the industry tend to follow (Madrid-Guijarro & Duréndez, 2023), to remain competitive (Khanra et al., 2022).

Values-based motivations were also mentioned, mainly in the Consumer Goods and FMCG, and Retail and Pharmaceuticals clusters. Here, the findings highlight organisational purpose, long-term brand value, and managing risk as reasons for as key reasons underpinning support for organisational sustainability goals. This adds to research showing that internal values and ethics can work alongside external pressure to drive sustainability action (Madrid-Guijarro & Duréndez, 2023). The findings suggest that organisations respond to both external pressure and internal values, with brand and reputation being especially important in consumer-facing industries (Madrid-Guijarro & Duréndez, 2023).

Overall, the findings show that stakeholder pressure is multi-dimensional, including regulatory, customer, investors and shareholder, and market-based influences. Organisations that meet compliance needs while also taking a proactive approach seem better placed for building long-term capability and aligning trends in the global sustainability arena. This supports research showing that ongoing engagement with stakeholders helps drive GI (Khanra et al., 2022; Song et al., 2020), while also adding insight from emerging-market clusters.

6.2.1.4. Conclusion of the discussion of the findings for stakeholder pressure

The findings show alignment with existing literature that identifies stakeholder pressure as a key influence on how organisations approach GI. Similar to past studies, regulation, customer expectations, investor interests, and peer influence all act as drivers that encourage organisations to adopt greener practices and improve their environmental performance (Khanra et al., 2022; Madrid-Guijarro & Duréndez, 2023). The findings also support the view that regulation works not only as a compliance requirement but also as a catalyst for innovation. Customer and investor pressures encourage greater accountability and transparency.

Values-based motivations such as organisational purpose, brand reputation, and long-term risk management were also found to support these external pressures. This reflects earlier studies that highlight the combined role of ethical and market-based motivations in driving sustainability action.

Overall, the findings align with existing research and reaffirm the importance of multiple stakeholder groups in shaping sustainability objectives. That organisations responding positively to diverse stakeholder expectations are better placed to integrate sustainability

into their strategy, strengthen competitive advantage, and align with global sustainability trends.

6.2.2. Theme 2: Leadership commitment as a driver

6.2.2.1. Recap of findings on leadership commitment

Leadership commitment emerged as an internal driver for GI across all clusters. Accountability and ownership were consistent themes. In some clusters, such as Construction and Building Materials, leadership focused on compliance and formal governance, ensuring that sustainability standards were met and reported transparently. In others, particularly Consumer Goods and FMCG, and Retail and Pharmaceuticals, leaders linked sustainability with innovation, competitiveness, and ethical responsibility. These variations point to commitment developing through structural accountability and personal conviction. Across all clusters, leaders who viewed sustainability as a shared organisational goal, instead of just another compliance task, were better able to inspire collaboration and long-term focus.

Overall, the findings suggest that effective leadership commitment depends on combining clear governance with moral intent and shared responsibility. When leaders lead with purpose as well as process, sustainability starts to feel like part of how the organisation works, not just something it has to do.

6.2.2.2. Recap of literature on leadership commitment

There is scholarly alignment that leadership commitment is an important component in the success of fostering GI (Bhatia, 2021; Bhatia & Jakhar, 2021; Wang & Juo, 2021; Wiredu et al., 2024). Thus, it can be argued that to create a work setting where employees are free to experiment and reconfigure processes to optimise sustainability outcomes, such as new products, leadership must demonstrate a commitment to and actively support GI initiatives. This kind of commitment is essential as it acts as a bridge to overcome everyday challenges like limited capital investment, time pressures, and gaps in knowledge (Madrid-Guijarro & Duréndez, 2023). This is why leadership commitment is an important consideration in exploring the RQ.

6.2.2.3. Discussion of the findings with literature on leadership commitment

The findings show that leadership commitment is important in shaping sustainability and green-innovation efforts across all clusters. The evidence suggests that organisations differ in how strongly leadership commitment is expressed and how consistently it is

shared. In some clusters, leadership commitment was visible through support, accountability, and alignment with sustainability priorities, while in others it appeared more cautious or heavily dependent on compliance requirements. This reflects the wider literature that highlights that organisations with committed leadership are better able to implement environmental strategies and drive GI (Bhatia, 2021; Bhatia & Jakhar, 2021; Wiredu et al., 2024). The evidence particularly aligns with Wiredu et al.'s (2023) view that leadership is crucial for championing sustainability goals and integrating them into everyday business practice.

In the Retail and Pharmaceuticals and Papermaking and Recycling Services clusters, leadership commitment was closely tied to governance, accountability, and alignment with global standards. The findings emphasise transparency, oversight, and ethical responsibility as part of how organisations approached sustainability. These findings echo Wang and Juo (2021), who argue that leadership commitment ensures resource allocation and supports environmental performance, especially where sustainability may traditionally be viewed as a trade-off with efficiency.

In contrast, the Consumer Goods and FMCG cluster, leadership commitment appeared to be more values-driven, with some leaders showing personal enthusiasm and a desire to embed sustainability within the business. This aligns with Bhatia and Jakhar (2021) who argue that top-management support fosters organisational learning and encourages creative thinking needed for GI. The findings also resonate with Shehzad et al. (2024), who suggest that without leaders prioritising sustainability and allocating supporting resources, organisations struggle to shift from traditional operational routines to innovative green solutions. In the instance where sustainability was connected to procurement support what Sahoo et al. (2022) argued that leadership shapes how organisations mobilise green knowledge.

In the Construction and Building Materials cluster, leadership commitment appeared uneven with mixed levels of engagement and understanding across senior teams. This pattern reflects Begum et al.'s (2022) broader view that fragmented leadership commitment can make it difficult for organisations to embed sustainability consistently.

Overall, the findings reinforce strong scholarly agreement that leadership commitment underpins the success of green-innovation efforts (Bhatia, 2021; Wiredu et al., 2024). Leaders who combine personal conviction, structural accountability, and resource

support are better positioned to create conditions where employees can experiment, overcome barriers, and integrate sustainability into long-term organisational practice.

6.2.2.4. *Conclusion of the discussion of the findings for leadership commitment*

The findings show alignment with existing literature that identifies leadership commitment as an important internal driver of GI. Consistent with previous studies, the results indicate that when leaders demonstrate support, accountability, and alignment with sustainability goals, organisations are better able to implement environmental strategies to strengthen their green-innovation performance (Bhatia, 2021; Bhatia & Jakhar, 2021; Wiredu et al., 2024). The findings also reflect the view that committed leadership helps secure the resources and structures needed to embed sustainability into everyday business practice, thus help with GI (Wang & Juo, 2021; Madrid-Guijarro & Duréndez, 2023).

The evidence further suggests that leadership commitment can be expressed in different ways. In some clusters, it appeared through governance, transparency, and adherence to global standards, while in others it was more values-driven and linked to enthusiasm, purpose, and organisational identity. This shows a nuance of difference because the way leaders commit to sustainability varies across clusters instead of looking the same. This supports earlier research showing that formal accountability and internal motivation contribute to shaping sustainability outcomes (Bhatia & Jakhar, 2021; Shehzad et al., 2024). Instances where sustainability was connected to procurement and operational decisions also reflect arguments that leadership plays a role in mobilising green knowledge (Sahoo et al., 2022).

Overall, the findings show similarity with existing research that organisations with clear and consistent leadership commitment are better placed to integrate sustainability into long-term strategy and support ongoing green-innovation efforts (Bhatia, 2021; Wiredu et al., 2024). The nuance of difference in this study is that the way leaders commit to sustainability varies across clusters instead of looking the same, which offers a more contextual understanding of how leadership shapes sustainability practice.

6.2.3. Theme 3: Sustainability mindset as a driver

6.2.3.1. Recap of findings on sustainability mindset

A review of the evidence revealed that organisations demonstrated varying levels of maturity in adopting a sustainability mindset. The evidence showed that storytelling and

narrative for mindset shift played a role in creating awareness and promoting behavioural change, particularly through leadership communication and collective learning. Short-termism and strategic myopia emerged as barriers, as participants acknowledged that financial pressures and operational demands often limited long-term sustainability thinking. In contrast, purpose-driven and values-based organisational identity was observed in those who viewed sustainability as integral to their business philosophy, linking ethical responsibility with organisational purpose.

Across clusters, sustainability mindset was described as both a moral conviction and a practical necessity. The findings suggest that sustained mindset change depends on leadership, consistent education, and embedding purpose within strategy. This can enable organisations to balance profit motives with long-term environmental responsibility.

6.2.3.2. Recap of literature on sustainability mindset

Sustainability mindset did not appear as a theme in the literature reviewed prior to commencing the study. As outlined in Section 6.1, the researcher conducted an additional search to see whether the theme appeared in existing literature or if further exploration was required.

Three step-process

Step 1

For the keyword search, three articles drawn from the Chapter 2 literature review were chosen and examined. These include: Bhatia and Jakhar (2021); and Wiredu et al. (2024); and Xie et al. (2019).

The keywords that were used for the search include: “sustainability mindset” “mindset” “attitude” “personal values” “values” “perception” “sustainability behaviour” “ethos” “culture”

All three articles yielded matches from the keyword search. However, in the case of Wiredu et al. (2024), the references to attitudes appeared only where future research was mentioned as the study did not yield an other matches. It did not provide any support for the subtheme of sustainability mindset under the leadership commitment theme. Similarly, a keyword search for Bhatia and Jakhar (2021) and Xie et al. (2019) only

yielded matches in the references they cited, not the main content of their study. Next, the researcher advanced to Step 2.

Step 2

This step involved searching for work by three scholars who were frequently cited in the reviewed literature: Sayantan Khanra, Manjot Singh Bhatia, and Xuemei Xie. Recent articles published by these authors in the past five years were reviewed. The search produced the following results:

Table 18: Search results of scholar articles in last 5 years

Scholar	Title of article	Authors of article
Sayantan Khanra	Bibliometric analysis and literature review of ecotourism: Toward sustainable development	Khanra, S., Dhir, A., Kaur, P., & Mäntymäki, M. (2021).
	Big data analytics in healthcare: a systematic literature review	Khanra, S., Dhir, A., Islam, A. N., & Mäntymäki, M. (2020).
	Big data analytics and enterprises: a bibliometric synthesis of the literature	Khanra, S., Dhir, A., & Mäntymäki, M. (2020).
Manjot Singh Bhatia	Green supply chain management: Scientometric review and analysis of empirical research.	Bhatia, M. S., & Gangwani, K. K. (2021).
	Linking stakeholder and competitive pressure to Industry 4.0 and performance: Mediating effect of environmental commitment and green process innovation.	Bhatia, M. S., & Kumar, S. (2022).
	Integration of green and lean practices for sustainable business management.	Singh, R. K., Kumar Mangla, S., Bhatia, M. S., & Luthra, S. (2022).
Xuemei Xie	How can open innovation ecosystem modes push product innovation forward? An fsQCA analysis.	Xie, X., & Wang, H. (2020).
	Green process innovation and financial performance: The role of green social capital and customers' tacit green needs.	Xie, X., Hoang, T. T., & Zhu, Q. (2022).
	How to bridge the gap between innovation niches and exploratory and exploitative innovations in open innovation ecosystems.	Xie, X., & Wang, H. (2021).

Khanra's search did not produce any positive results from the reviewed articles. Of the articles reviewed by Bhatia, there was a positive word search, however, upon closer inspection, the keyword was not referenced as pertaining to sustainability mindset. When searching the articles by Xie, one yielded a positive word search result. However, although the paper mentions attitude and perception barriers as obstacles to GI (Xie et

al., 2022), it does so only briefly. It defines these barriers mainly as resistance to change among employees and managers, but does not explore them further than that. Instead, the discussion relies on other studies and quickly shifts to arguing that green social capital can help overcome such barriers. As a result, the article provides only surface-level context and does not offer a substantive examination of mindset. Given above, the researcher proceeded to the third step.

Step 3

As outlined in Section 6.1, if no suitable literature was found in step two, an additional search was carried out using highly regarded peer-reviewed journals in the field. In this case, the Journal of Cleaner Production was consulted, as it is a well-established and peer-reviewed academic journal. From the search, the researcher selected the below two articles to compare with findings of this study as both of them had sufficient information to be able to carry out the comparison required.

Table 19: Literature selected for comparison with sustainability mindset findings

Journal	**Title of article**	**Authors of article**
Journal of Cleaner Production, *480*, 144082.	A paradoxical perspective on the time dimension of corporate sustainability: Having both finite and infinite mindsets to play the game.	Wu, L., Subramanian, N., Pawar, K. S., Wang, M., Kumar, A., & Tan, K. H. (2024).
Journal of Cleaner Production, *415*, 137887.	How do firms build dynamic capabilities to develop sustainable products? A multiple case study in the manufacturing industry.	Kortus, L., & Gutmann, T. (2023).

6.2.3.3. Discussion of the findings with literature on sustainability mindset

The findings show that organisations across all clusters demonstrate varying levels of maturity in developing a sustainability mindset, which is shaped by cultural norms, leadership beliefs, and individual convictions. A strong organisational culture emerges as one of the most influential foundations for cultivating such a mindset. In organisations where sustainability is embedded in everyday practices, shared values, and ethical beliefs, employees and leaders alike are more likely to internalise sustainability as part of their identity and decision-making. This emphasis on personal conviction, identity formation, and the internalisation of sustainability expands on existing literature, which primarily positions culture as a structural enabler rather than a mechanism shaping individual meaning-making (Kortus & Gutmann, 2023). The findings therefore add depth

by showing how sustainability becomes embodied at the micro-behavioural level, through habits, and moral framing.

Leadership influence further strengthens this dynamic. When leaders actively communicate sustainability narratives, model pro-environmental behaviour, and integrate sustainability into strategic direction, they create an environment where sustainability thinking becomes normalised. This is corroborated by Wu et al. (2024) who posit that a leader's mindset directly guides their decision-making and behaviour. As a result, leadership functions not only as a governance mechanism but also as a catalyst for collective learning, influencing how employees interpret and adopt sustainability principles across the organisation. While Kortus and Gutmann (2023) highlight leadership as essential for capability development, the findings introduce nuance by demonstrating that internal storytelling, play an role in shaping sustained mindset change. This highlights leadership as an identity-shaping force, rather than only a strategic directive mechanism.

However, the findings also indicate that misalignment between organisational leaders, where different executives hold conflicting views on sustainability, can dilute these efforts. Such inconsistencies create mixed signals for employees and weaken the organisation's ability to embed a coherent and unified sustainability mindset. This may offer a potential extension to existing scholarship within this mindset exploration, which seems to not deeply address internal leadership fragmentation. Although Wu et al. (2024) advocate for a paradoxical perspective that balances finite and infinite mindsets and suggest that organisations can manage this tension, this study suggest an internal leadership coherence is important and precondition for this to happen. By showing how competing executive priorities can create uncertainty for employees about what behaviours and values the organisation expects, the findings suggest leadership coherence as a previously underexamined condition for sustainability mindset formation and continuation.

At the same time, the findings show that short-term financial pressures and resistance to change act as significant constraints. These barriers often limit long-term sustainability thinking and reinforce operational mindsets focused on immediate organisational needs. Similarly, Wu et al. (2024) describe this as a finite mindset, where businesses treat success like a short game, focusing on quick financial return wins, to remain competitive in the immediate term. In such contexts, sustainability is perceived as costly, disruptive, or secondary to core business objectives. While the literature acknowledges structural

and economic barriers (Kortus & Gutmann, 2023), the findings strengthen this understanding by illustrating how short-termism functions as a mindset barrier, shaping interpretations, priorities, and beliefs. This adds a cognitive and psychological dimension to the discussion of sustainability challenges, as supported by the Wu et al.'s (2024) mindset approach.

Despite these challenges, organisations that view sustainability as a moral responsibility or purpose-driven imperative tend to show stronger and more sustained adoption of a sustainability mindset. These organisations emphasise balancing people, profit, and planet, suggesting that sustainability is understood not only as an ethical responsibility but also as a practical requirement for long-term organisational resilience. This aligns with values-based perspectives Kortus and Gutmann (2023) point to but adds nuance by showing how moral framing and purpose-driven identity operate as stabilising forces that anchor sustainability practices even under financial pressure. Similarly, Wu et al. (2024) show that adopting an infinite mindset strengthens organisations, encourages innovation as well as enhance their ability to inspire, enabling them to realise both long-term tangible and intangible gains. The findings therefore provide a richer account of how ethical commitment strengthens mindset maturity and long-term resilience.

6.2.3.4. *Conclusion of the discussion of the findings for sustainability mindset*

The findings support existing literature and show similarity that emphasises the role of organisational culture and leadership in shaping sustainability-related behaviour. Consistent with Kortus and Gutmann (2023), the results show that culture serves as an important foundation for sustainability adoption, and that leadership communication, modelling, and strategic alignment help normalise sustainability thinking. The findings also align with prior research noting that financial pressures and organisational resistance remain significant barriers to long-term sustainability commitment (Kortus & Gutmann, 2023). This is also consistent with Wu et al. (2024) who associate a finite mindset with a focus on short-term, quantifiable performance outcomes.

However, the study shows nuance of difference by demonstrating how sustainability becomes internalised at a personal and behavioural level, extending beyond structural and strategic influences highlighted in the literature. The emphasis on moral framing, personal conviction, and identity formation offers a more detailed understanding of how individuals within organisations come to embody sustainability principles, an area lightly addressed in existing literature. The findings also suggest that leadership misalignment, where executives hold conflicting priorities, can weaken sustainability mindset formation.

This dynamic is not deeply addressed in the reviewed scholarship and therefore represents a potential extension to current understanding. Additionally, the study reframes short-termism as a mindset barrier rather than merely an operational constraint, adding a psychological dimension to sustainability challenges, deepening the finite-infinite mindset perspective articulated by Wu et al. (2024).

Overall, the findings show similarity with existing research that culture and leadership shape sustainability thinking, while the nuance of difference lies in how mindset formation works at a personal, behavioural, and organisational level in ways the literature only touches on.

6.2.4. Theme 4: Strategic orientation as a driver

6.2.4.1. Recap of findings on strategic orientation

Across clusters, participants describe a similar strategic movement towards adaptability, long-term thinking, as well as evidence-based sustainability. The findings show three key aspects of strategic orientation that drive GI: strategic integration and alignment, strategic foresight and opportunity orientation, and a business case that links sustainability to value creation. Integration and alignment appear most consistently across the clusters, with participants describing how sustainability is built into operations, planning, and measurement. Foresight and opportunity reflect the forward-looking mindset that connects sustainability to growth, innovation, and future relevance. It appears strongly in the Consumer Goods and FMCG, Retail and Pharmaceuticals and Papermaking and Recycling Services. Value creation captures how sustainability initiatives generate tangible and intangible benefits, from cost efficiencies and innovation to improved reputation and stakeholder trust – which is present across the clusters.

The cluster context also influences how this plays out, and differences reveal cluster nuances. Construction and Building Materials cluster focus on measurement and market responsiveness; Consumer Goods and FMCG cluster linked strategy to profitability and corporate responsibility; Retail and Pharmaceuticals cluster emphasised leadership and values-driven strategic orientation; and the Papermaking and Recycling Services cluster combined compliance with long-term commitment. These differences suggest that external and internal values shape how sustainability becomes part of the strategy. Across these clusters, the degree of strategic foresight and opportunity orientation varied - some organisations viewed sustainability as market-driven opportunity creation, while others saw it primarily as risk mitigation and alignment.

Overall, this shows that strategic orientation supports innovation, marking a shift from reacting to change to planning ahead. Organisations that build sustainability into their strategy show stronger adaptability and more potential for GI.

6.2.4.2. Recap of literature on strategic orientation

Strategic orientation did not appear as a theme in the literature reviewed prior to commencing the study. In line with the three-step process outlined in Section 6.1, an additional search was conducted to determine whether the existing literature discussed the theme, or if the researcher had to conduct a further search.

Three step-process

Step 1

To initiate the keyword search, three articles from the Chapter 2 literature review were selected. These include: Appiah and Essuman (2024); Khanra et al., (2022); and Wang and Juo (2021).

The keywords that were used for the search include: “strategic orientation” “orientation” “green orientation” “sustainability orientation” “innovation orientation” “strategic direction” “strategic priority*” “strategic approach*”

All three articles yielded matches from the keyword search. However, in the case of Wang and Juo (2021), the references to SO appeared only within the sources they cited, rather than being addressed directly within their own study. It therefore did not provide substantive support for the theme. On the other hand, Khanra et al., (2022), does appropriately mention SO, however, the paper is not extensive because it is primarily bibliometric in nature with a GI focus via an RBV lens. According to Khanra et al., (2022), SO does play an important role in how well an organisation can use GI. Moreover, Appiah and Essuman (2024) provide a broader discussion on SO, their work has been selected to inform the analysis for the discussion.

6.2.4.3. Discussion of the findings with literature on strategic orientation

The findings show that organisations across clusters view strategic orientation as important to advancing sustainability and GI. Sustainability is increasingly built into operations, planning, and measurement, showing a strong emphasis on integration and alignment. This is similar to the view of Appiah and Essuman (2024), who explain that organisations in developing contexts often internalise sustainability into their core

processes to enable consistent implementation of green process innovation. In both cases, embedding sustainability into day-to-day activities is seen as key to creating a foundation for long-term progress rather than a stand-alone initiatives.

Foresight and opportunity orientation also appeared strongly across clusters such as Consumer Goods and FMCG, Retail and Pharmaceuticals, and Papermaking and Recycling Services. The findings highlight long-term planning, future-proofing, and innovation as key strategies to remain relevant in changing markets. This aligns with what Appiah and Essuman (2024) claim that strategic foresight helps organisations identify and exploit green opportunities, linking environmental action with competitive advantage. When organisations recognise sustainability as part of strategic opportunity-seeking rather than as compliance, they tend to develop stronger GI capabilities (Appiah & Essuman, 2024). The evidence in this study shows a similar pattern, where foresight is linked to innovation and growth.

Value creation also emerged as an important dimension of strategic orientation. The findings show that sustainability initiatives can generate tangible and intangible benefits, such as efficiency, cost savings, innovation, and reputation gains. This is consistent with Appiah and Essuman (2024), who conclude that financial and operational benefits often follow once organisations commit to sustainability-oriented innovation. Appiah and Essuman (2024) emphasise that such benefits appear through improved processes, resource efficiency, and strengthened market positioning. Therefore, the findings support the idea that organisations in developing contexts view sustainability as a moral or compliance requirement, but also as a way to create lasting business value.

Overall, the findings add to the argument by Appiah and Essuman (2024) by showing that strategic orientation acts as a broader organising mechanism for sustainability because it links integration, foresight, and value creation in a reinforcing way. The findings connect three elements to adaptability and innovation, highlighting that organisations that embed sustainability, through GI, into their strategy appear better positioned to sustain long-term competitiveness and resilience.

6.2.4.4. Conclusion of the discussion of the findings for strategic orientation

In summary, the findings show similarity with existing literature that strategic orientation has an important part in how organisations support sustainability and GI. Across clusters, participants described sustainability as something that is built into everyday operations and long-term planning, which is similar to the view of Appiah and Essuman (2024). Both

the literature and the findings suggest that treating sustainability as part of core strategy, rather than a separate activity, helps organisations make steady progress over time.

The findings also highlight similarity in how looking ahead, exploring new opportunities, and preparing for future changes are important to how organisations build GI capability. This reflects Appiah and Essuman's (2024) point that strategic foresight helps organisations link environmental action with competitiveness.

The nuance of difference in this study lies in how integration, foresight and value creation work together in a reinforcing way, showing how organisations connect these elements in practice instead of treating them separately.

Overall, the findings show similarity with existing research that clear strategic direction supports sustainability, while the nuance of difference lies in the combined pattern where integration, foresight, and value creation strengthen long-term resilience.

6.2.5. Theme 5: Resource constraints as a barrier

6.2.5.1. Recap of findings on resource constraints

The researcher's overall analysis demonstrated that resource constraints strongly influenced how organisations approached GI. Across all cases, budgetary and financial limitations, profitability, and budget control were central in determining whether sustainability initiatives were pursued or delayed.

Across groups, participants expressed different but related experiences. In Construction and Building Materials, organisations focused on balancing profit with sustainability by using existing resources efficiently and ensuring financial stability before innovation. Consumer Goods and FMCG participants stressed the cost-benefit and ROI trade-offs of green products and consumer price sensitivity, showing that market affordability shaped decision-making. Within Retail and Pharmaceuticals, the emphasis was on improving operational processes and supply chain partnerships to manage limited budgets. Finally, Papermaking and Recycling Services participants underlined high costs and reliance on external funding but also recognised that collaboration and access to green finance could support progress.

Collectively, these insights revealed that while sustainability was valued, its implementation was constrained by economic realities. Resource scarcity drove

organisations to adopt cautious, efficiency-based approaches rather than transformative innovation. The findings suggest that businesses need targeted financial support, leadership commitment, and clearer policy incentives to integrate GI meaningfully into core operations. Education and training in sustainable business planning could further enable organisations to move beyond short-term cost concerns.

The analysis points to resource constraints as a decisive barrier to sustainable innovation. Overcoming these barriers through strategic investment and institutional support is essential for organisations that are aiming to align profitability with long-term environmental responsibility.

6.2.5.2. Recap of literature on resource constraints

GI is challenging because it demands time, financial resources, and new skills (Khanra et al., 2022; Xie et al., 2019). Yet, these barriers also push organisations to rethink how they use their resources. When organisations view constraints as opportunities to innovate, they can discover more efficient ways to operate and compete (Singh et al., 2021). Strengthening internal capabilities and learning to adapt existing resources are key steps in this process (Madrid-Guijarro & Duréndez, 2023). By improving how they manage knowledge, technology, and investment, organisations can reduce costs and make progress toward sustainability goals (Khan et al., 2021). Overall, while GI can seem costly and complex, developing flexible and resourceful strategies allows organisations to balance financial pressures with long-term environmental responsibility as well as competitiveness (Singh et al., 2021). All this highlights how internal limitations and resource decisions shape an organisation's ability to pursue GI, which directly supports the focus of RQ1.

6.2.5.3. Discussion of the findings with literature on resource constraints

The findings show that resource constraints have a role in how organisations approach GI. Across clusters, the findings show that organisations face various constraints, including financial pressures, cost-benefit trade-offs, supply chain dependencies, and the need to optimise operations. Financial limitations and budget control strongly shaped whether sustainability initiatives were pursued or delayed. This reflects earlier studies that identify cost and limited budgets as barriers to GI (Khan et al., 2021; Khanra et al., 2022; Madrid-Guijarro & Duréndez, 2023). As in these studies, the findings show how high costs and uncertain returns made it difficult to prioritise green projects over short-term financial goals. Beyond finance, time and skills also influenced what could realistically be achieved, which shows that resource scarcity goes beyond budgets alone.

The focus on efficiency and cost control supports Xie et al. (2019), who argued that organisations should choose green process improvements first, as these can reduce costs and build a base for later product innovation.

The patterns seen across clusters are similar to what earlier research has found. In Construction and Building Materials, organisations aimed to balance profit and sustainability by using existing resources more efficiently. This reflects Khanra et al. (2022), who found that cost concerns often push organisations to make small, gradual changes rather than large-scale innovation. In the Consumer Goods and FMCG cluster, the findings emphasise price sensitivity and return on investment, which is consistent with Madrid-Guijarro and Duréndez (2023), who note that managers often hesitate to invest when the financial payoff is uncertain. They also spoke about market-driven cost-benefit trade-offs, which shows that affordability and consumer expectations directly shaped decisions on green products. In Retail and Pharmaceuticals, the emphasis on improving operational processes and supply chains to manage budgets also supports Xie et al. (2019) – they link process efficiency with resource constraints.

The findings from Papermaking and Recycling Services highlight how high costs and limited access to finance can restrict progress, while also emphasising the importance of collaboration and external funding. This is supported by Bataineh et al. (2024), who argue that GI requires knowledge and resources that may not exist within one organisation. This suggests that partnerships and green finance can help address financial barriers, although, such opportunities remain uneven across clusters. This suggests that access to finance and sustainable materials is often shaped by wider industry and policy factors that organisations cannot easily control.

The findings also connect with Singh et al. (2021), who emphasise that organisations can build and reconfigure internal capabilities to manage these challenges. Evidence from this study shows that some organisations are already adapting existing skills and operations to fit sustainability goals. However, most still view sustainability through a financial lens, seeing it as a cost rather than an opportunity. The efforts to optimise operations and use resources more efficiently demonstrate a practical response to constraints but also highlight that deeper transformation requires strategic capability development and institutional support. This is supported by Madrid-Guijarro and Duréndez (2023), who found that managerial perceptions of cost and time often limit commitment to environmental innovation.

Overall, the findings confirm that while sustainability is valued, financial constraints remain a decisive barrier to implementation. Yet, other forms of constraint, such as supply chain dependence and limited operational capacity, also restrict how far organisations can go. Organisations continue to prioritise efficiency and risk management over transformational change, which is also reflected in current literature. Moving forward though, targeted financial support, leadership commitment, and policy incentives may be essential for organisations to move past short-term cost concerns and integrate GI into their core operations (Khanra et al., 2022; Singh et al., 2021).

6.2.5.4. Conclusion of the discussion of the findings for resource constraints

In summary, the findings show that financial and resource constraints continue to limit how organisations engage with GI. These constraints included cost pressures, supply chain dependencies, and the need to optimise operations alongside managing profitability. Across clusters, cost pressures, budget control, and uncertain returns were factors that shaped decisions about GI. This supports previous research that identifies financial barriers as one of the biggest obstacles to innovation (Khanra et al., 2022; Madrid-Guijarro & Duréndez, 2023). While some organisations are finding ways to adapt their operations and build internal capabilities (Singh et al., 2021), most still view sustainability through a financial lens. Opportunities such as collaboration and access to green finance can help, but these remain uneven across industries (Bataineh et al., 2024). To move forward, stronger leadership and improved operational capacity are needed to help organisations overcome short-term cost concerns and embed GI into long-term strategic planning (Khan et al., 2021; Xie et al., 2019).

Overall, the findings show similarity with existing research that financial pressures, cost-benefit trade-offs, and resource limitations act as key barriers to GI.

6.2.6. Theme 6: Integration constraints as a barrier

6.2.6.1. Recap of findings on integration constraints

The researcher's overall analysis explored how participants across clusters understood and experienced integration constraints in embedding sustainability within their organisations. Across cases, these constraints clustered around four interrelated themes: fragmented organisational integration and accountability, weak cross-functional collaboration and governance cadence, supplier and value chain misalignment, and strategic-operational disconnect with blind target setting.

In the Construction and Building Materials cluster, participants emphasised operational alignment through KPIs and cross-functional cooperation. The Consumer Goods and FMCG cluster revealed fragmented integration, with sustainability often confined to specific functions and hindered by blind target setting and poor communication and a need to balance sustainability requirements with operational feasibility and production efficiencies. The Retail and Pharmaceuticals cluster showed stronger coordination and systematisation yet faced challenges in maintaining pace and clarity across departments. In contrast, the Papermaking and Recycling services cluster highlighted external barriers such as limited infrastructure, financial constraints, and technological gaps. These patterns reveal that integration weaknesses are often rooted in internal fragmentation and inconsistent governance cadence, compounded by value chain and supplier misalignment.

Collectively, these insights reveal that integration is uneven, influenced by organisational structure, maturity of the cluster sectors, and contextual pressures. For organisations, this underscores the need for leadership-led coordination and clearer performance frameworks. Addressing these systemic integration gaps - by strengthening accountability mechanisms, improving cross-functional rhythm, and aligning strategic intent with operational capacity - emerges as central to advancing sustainable innovation. Ultimately, effective integration enables sustainability via GI to move beyond compliance toward genuine organisational transformation and long-term strategic alignment.

6.2.6.2. Recap of literature on integration constraints

In conclusion, successful GI is influenced by how well organisations can integrate and coordinate their internal functions. As highlighted by Khanra et al. (2022) and Bataineh et al. (2024), effective GI requires strong collaboration across departments such as marketing, supply chain, and production. Tuấn (2022) further notes that international guidelines can provide a useful roadmap for integrating these functions. However, integration is not without its challenges. Organisations must overcome barriers such as departmental silos, inadequate employee training, and system incompatibilities. These issues can fragment GI efforts and slow innovation progress.

Moreover, as Khan et al. (2021) explain, integration alone is not enough unless supported by collaboration that promotes innovation and environmental improvement. When integration barriers persist, they can hinder knowledge sharing and resource alignment, which makes it harder to achieve GI. Therefore, exploring how organisations

develop the necessary resources and collaborative capabilities is important for understanding how they can overcome integration challenges and create lasting, sustainable transformation. These challenges show how internal organisational factors can either strengthen or weaken the foundations needed for GI. This directly informs RQ1 by highlighting how internal dynamics influence the development of resources for GI.

6.2.6.3. Discussion of the findings with literature on integration constraints

The findings from this study show that while integration is widely seen as important for embedding sustainability and GI, achieving it in practice is often uneven and complex. This is supported by the work of Khanra et al. (2022) and Bataineh et al. (2024), who note that effective GI depends on strong collaboration between departments such as marketing, supply chain, and production. Similarly, the findings descibe how weak coordination and fragmented collaboration slowed progress towards sustainability goals. However, this study adds further insight by showing that the causes of integration challenges differ across industries and organisational contexts.

Khanra et al. (2022) and Tuấn (2022) highlight the need for cross-functional collaboration and clear frameworks to guide GI. This study supports those views but also shows that even when frameworks exist, they do not always lead to consistent practice. This suggests that having formal structures alone is not enough. Effective integration also depends on leadership, accountability, as well as consistent coordination. These findings show that integration issues are can be procedural rather than purely structural.

The findings also reveal that supplier and value chain misalignment are significant barriers, particularly in sectors such as Papermaking and Recycling Services. While Tuấn (2022) points to international guidelines as a way to align processes, this study finds that resource constraints, limited infrastructure, and technological gaps can make such alignment difficult. This shows that integration challenges in developing contexts often extend beyond the organisation itself.

Stronger coordination was found in the Retail and Pharmaceuticals cluster compared with the Consumer Goods and FMCG cluster, where integration remained fragmented. This supports Khanra et al.'s (2022) view that silos can make GI less effective, but this fragmentation often stems from differences in leadership and resource capacity.

Overall, the findings are consistent with existing literature that sees collaboration and integration as key to GI. This study shows that integration is shaped by leadership, governance, as well as the maturity of different industries.

6.2.6.4. Conclusion of the discussion of the findings for integration constraints

In conclusion, this study supports earlier research showing that collaboration and integration are central to GI (Khanra et al., 2022; Bataineh et al., 2024). The findings are broadly in line with existing studies, but they also illustrate how integration challenges play out in different industry contexts. While previous studies highlight structural barriers, this research shows that many challenges come from how processes and coordination are managed, not just from structure. The findings also show that resource constraints and supply chain misalignment can make integration even harder, especially in developing contexts (Tuấn, 2022).

Overall, the findings align with existing literature by showing that effective integration depends not only on frameworks and systems but also on leadership capability, coordination quality, as well as organisational readiness.

6.2.7. Theme 7: Employee skills as a capability

6.2.7.1. Recap of findings on employee skills

This analysis showed that across all clusters, building employee skills and organisational capability formed the backbone of GI. Participants consistently linked sustainability progress to the availability of skilled, informed, and empowered employees who can translate strategic goals into daily operational practices. This sense of empowerment of having autonomy and support to act, was seen as important in addition to the technical skills that enable employees to make meaningful contributions towards sustainability. What is evident also, is that developing green skills was not only about technical knowledge and capacity but also about fostering awareness and the ability to act adaptively within environmental and market contexts that are constantly evolving.

Clusters varied in emphasis. Construction and Building Materials focused on operational learning, cross-functional understanding and technical skills. Consumer Goods and FMCG highlighted awareness, education, and behavioural change. Retail and Pharmaceuticals stressed forward-looking skillsets and technical training. Papermaking and Recycling Services emphasised applied technical capacity building where it was

happening. One participant reflected on interdisciplinary internal learning. The others did not strongly highlight employee skills.

The findings reveal that organisational sustainability maturity depends on continuous learning, internal knowledge exchange, and organisations being deliberate about skill investment. Within this context, employee competence becomes a catalyst and constraint for sustainability transformation. For organisations, this shows the importance of needing to institutionalise sustainability education by also aligning training systems with innovation objectives and cultivating a culture where every employee understands and contributes to environmental goals. This strategic investment in green-skills has the potential to enable business to take sustainability from just an aspirational intent into a performance-driven practice that is deeply embedded within organisations.

6.2.7.2. Recap of literature on employee skills

Employees play a central role in how organisations achieve their GI goals. Building green skills and capabilities allows organisations to meet environmental objectives while staying competitive (Aftab et al., 2022; Wang & Juo, 2021). Strengthening green human capital links employee knowledge and commitment directly to innovation outcomes (Wang & Juo, 2022). Creative and capable employees also help organisations adapt more easily to environmental change; this shows that dynamic capabilities depend on people and their ability to innovate (Tuấn, 2022). So then, green human resource management practices that focus on training, support, and recognition are critical for developing this potential (Aftab et al., 2022). When organisations invest in people through skills, knowledge, and opportunities for creativity, they help create the foundation for sustainable innovation as well as long-term organisational success (Tuấn, 2022; Madrid-Guijarro & Duréndez, 2023).

6.2.7.3. Discussion of the findings with literature on employee skills

The findings support the view that employees are at the centre of how organisations achieve GI. Similar to Aftab et al. (2022) and Wang and Juo (2021), the findings linked progress in sustainability to the knowledge, skills, and motivation of employees who can turn strategy into action. Across all clusters, green skills were described as the foundation of innovation, which echoes the idea of green human capital (Wang & Juo, 2021). Like these studies, the evidence shows that investing in employee capability helps organisations design and apply green processes and products that support both environmental and business goals. The findings also highlight empowerment as part of capability. When employees feel trusted and supported to make sustainability decisions,

they are more likely to turn knowledge into action, reflecting the people-centred approaches discussed by Aftab et al. (2022).

The findings add to previous research by showing how green skills and capability development take shape in practice. The findings refer to awareness, learning, and adaptability, which align with the view that GHC and dynamic capabilities are influenced by creativity in problem-solving (Tuấn, 2022). The focus on ongoing learning and knowledge sharing also reflects the value of green human resource practices that build environmental awareness and encourage employee involvement in green efforts (Aftab et al., 2022).

The cluster differences add depth to existing literature. For example, the focus on operational learning in Construction and Building Materials supports earlier arguments that efficiency-based learning helps organisations prepare for larger-scale innovation (Xie et al., 2019). The Consumer Goods and FMCG cluster's focus on education and behaviour change aligns with Aftab et al. (2022), who link HR practices such as training and recognition to stronger environmental performance. Meanwhile, the forward-looking skillsets in Retail and Pharmaceuticals reflect Tuấn's (2022) view that creative and capable employees strengthen an organisation's ability to adapt in fast-changing markets.

However, the findings also highlight that capability is a driver and a constraint. While the literature mainly presents skills and creativity as enablers, the data here show that uneven investment in employee development can hold back progress. This suggests that for organisations to move from intention to action, they must integrate sustainability learning into daily operations and ensure consistent access to training across all areas. As noted by Madrid-Guijarro and Duréndez (2023), managerial commitment and resource allocation are important to making this possible.

Overall, findings extend the literature by showing how green skills and capability development work in practice. They confirm that building green human capability and creativity are critical for GI but also reveal that gaps in training and uneven learning cultures can slow sustainability transformation.

6.2.7.4. Conclusion of the discussion of the findings for employee skills

In conclusion, the findings show that developing green skills and capabilities is essential for achieving GI. Employees' knowledge, creativity, and adaptability are what allow

organisations to turn environmental goals into practical results that can have a positive impact on the organisation (Aftab et al., 2022; Wang & Juo, 2021; Tuấn, 2022). The findings show similarity with existing research that green human capability, continuous learning and creative problem solving are important in GI (Aftab et al., 2022). The findings also reveal that empowerment is important in enabling these capabilities to translate into meaningful sustainability outcomes. The evidence also highlights that capability can drive or limit progress, depending on how consistently organisations invest in learning and development of their employees. When sustainability training is part of everyday operations, employees are better able to innovate and respond to change in an effective way. However, when learning is uneven, progress slows. Ongoing commitment, supportive leadership, and effective resource allocation are therefore key to embedding GI as a lasting part of organisational practice (Madrid-Guijarro & Duréndez, 2023). These findings contribute to the body of knowledge by showing how green skills and employee capability development shape the practical implementation of GI across industries.

Overall, the findings show similarity with existing literature on the role of employee capability in shaping GI, reinforcing the importance of skills development and empowerment across different organisational contexts.

6.2.8. Theme 8: Technology and knowledge management as capabilities

6.2.8.1. Recap of findings on technology and knowledge management

This analysis revealed that technology and knowledge management strengthen how organisations operationalise sustainability through capability building. Across cases, participants described technology not merely as a tool but as an organisational capability that embeds sustainability into core processes, supports data visibility, as well as foster collaborative learning. There was a consistent use of digital tracking, performance dashboards, and communication systems which reflects an evidence-based sustainability governance approach.

In the Construction and Building Materials cluster, technology helped organisations embed data transparency and performance accountability through real-time monitoring. In the Consumer Goods and FMCG cluster, technology use was largely practical, and efficiency driven. Participants relied on machinery optimisation and pilot-testing new technologies, even though they noted gaps in knowledge retention when sustainability

experience left the organisation. Similarly, Retail and Pharmaceuticals, digital dashboards supported cross-functional learning as well as strategic coordination. The Papermaking and Recycling Services cluster highlighted adaptive use of technology and knowledge sharing despite infrastructure and resource constraints, which reflects turning limitations into innovation through collaboration.

The findings suggest that sustainable transformation relies on aligning technology strategy with human and institutional learning systems. Organisations that treat technology as a learning platform and a process capability could build stronger adaptive capacity, fostering innovation beyond compliance. This points to how, if knowledge sharing ecosystems are embedded within organisations, a critical pathway toward long-term sustainability integration and competitive advantage can be created for the benefit of the organisations.

6.2.8.2. Recap of literature on technology and knowledge management

Research highlights that effective GI is influenced by how well organisations gather, share, and apply environmental knowledge. When knowledge management and technology work together, organisations are better able to turn information into innovation that supports both environmental and business goals (Sahoo et al., 2022; Shahzad et al., 2021). Advanced analytics, reliable data systems, and leadership support are all important for this to succeed. However, Dahlquist (2021) notes that issues such as knowledge duplication, weak coordination, and uneven resource allocation can limit progress. Integrating knowledge systems across departments helps overcome these barriers by improving collaboration and responsiveness. Managing environmental knowledge effectively provides the foundation for long-term innovation and competitive advantage (Appiah & Essuman, 2024; Sahoo et al., 2022). Overall, technology and knowledge systems work hand in hand to help organisations turn environmental information into useful action. When these systems are aligned, organisations are better able to build the internal capabilities needed to support GI. It connects with RQ2 by revealing how these systems strengthen the capabilities needed to deliver meaningful GI outcomes.

6.2.8.3. Discussion of the findings with literature on technology and knowledge management

The findings show that technology and knowledge management play a key role in how organisations make sustainability part of their everyday work. Across all clusters, the findings show technology not only as a tool but as a way to build capability and support

learning. This aligns with Sahoo et al. (2022) and Shahzad et al. (2021), who explain that when technology and knowledge management are combined, they help organisations turn information into action. The findings describe how digital dashboards, tracking systems, and data-sharing tools help monitor performance and improve coordination, which supports Sahoo et al. (2022) who highlight that analytics can guide decision-making and strengthen environmental performance.

The study adds to this understanding by showing that technology becomes most effective when it is connected to how people learn and share knowledge. The findings show that technology is often viewed as encouraging collaboration and learning between departments. This reflects the view of Appiah and Essuman (2024), who note that information systems help create shared structures that support innovation. The findings also suggest that technology can help build organisational memory, keeping sustainability knowledge within the business even when staff change. This extends previous work by showing that technology can help sustain learning through informal collaboration and shared digital spaces, not only formal systems.

At the same time, the findings confirm that there are challenges. Dahlquist (2021) warns about duplication, weak coordination, and poor resource allocation, which were also seen here. The findings also indicate that systems did not always connect properly, and that knowledge was sometimes lost when tools were not used consistently. These gaps were especially visible in sectors where infrastructure and resources were limited. This shows that the success of technology-driven sustainability depends on investment and user capability.

Overall, the findings support existing research that sees technology and knowledge management as important to GI (Sahoo et al., 2022; Shahzad et al., 2021), but they also suggest a nuance. This study suggest that technology works best when it is part of a learning culture that connects data, people, and processes altogether. So then, rather than focusing only on systems, organisations need to use technology to build shared understanding, strengthen collaboration, and turn sustainability into a continuous and adaptive practice.

6.2.8.4. Conclusion of the discussion of the findings for technology and knowledge management

In conclusion, this study suggests that technology and knowledge management influence how organisations achieve GI. Similar to Sahoo et al. (2022) and Shahzad et

al. (2021), the findings show that when data systems and knowledge-sharing tools work together, organisations are better able to act on environmental goals.

The study also supports Appiah and Essuman (2024), who note that information systems help build structures for innovation. However, it adds to the literature by showing that technology is most effective when linked to learning and collaboration, not just as a technical resource. The evidence highlights that success depends on leadership, capability, as well as consistent use. When technology supports learning and communication, it helps organisations turn sustainability from compliance into an integrated, ongoing process.

Overall, the findings support existing research showing that technology and knowledge management enable GI. This study adds that their effectiveness increases when they are embedded in learning, collaboration, and everyday organisational practice.

6.2.9. Theme 9: Research and development as a capability

6.2.9.1. Recap of findings on research and development

A review of the evidence revealed that organisations across all clusters are investing in R&D as a key pathway to sustainability and innovation. Even though the degree to which they do this is different. What is similar is that across clusters, R&D was not a standalone technical activity but embedded in everyday processes, connecting operational efficiency, cost optimisation, as well as environmental responsibility.

In the Construction and Building Materials cluster, R&D reflected incremental improvement through technology adaptation and global learning. The Consumer Goods and FMCG cluster emphasised structured R&D aligned with product efficiency and circular innovation. Within the Retail and Pharmaceuticals cluster, R&D was mostly embedded in project planning and internal testing with some emphasis on supplier collaboration. The Papermaking and Recycling Services cluster revealed both formal and informal approaches to R&D. Some participants described targeted research priorities that are aligned to sustainability goals, while others described learning by doing and problem-solving with limited resources.

6.2.9.2. Recap of literature on research and development

R&D plays an important role in driving GI and supporting organisational competitiveness. As shown by Bataineh et al. (2024) and Khanra et al. (2022), investment in R&D enables

organisations to design green products and processes while improving efficiency. However, this link is shaped by strategic and contextual factors. Bhatia (2021) stresses that proactive environmental strategies make R&D investment more effective, while Zhang & Jin (2021) note that long-term success depends on building internal capabilities rather than short-term returns. Awan et al. (2021) and Khanra et al. (2022) further show that external knowledge strengthens these efforts, creating higher-order resources for sustainable organisational performance. All this suggests that R&D should be understood as a continuous, organisation-wide commitment that connects strategy, learning, and collaboration to achieve meaningful GI outcomes. This connects to RQ2, which examines how these capabilities are developed and applied in practice.

6.2.9.3. *Discussion of the findings with literature on research and development*

The findings show that R&D is an important part of organisational GI efforts, although its form and emphasis differ by industry. In the Construction and Building Materials cluster, the findings show that R&D is embedded in day-to-day operations and guided by practical goals such as improving cost, speed, and environmental performance. This is supported Bataineh et al. (2024) and Khanra et al. (2022), who argue that R&D helps organisations balance efficiency with sustainability while remaining competitive. However, the findings also show that financial pressures and regulatory demands shape the pace of innovation. This shows that in practice, R&D often competes with resource limits and market realities rather than operating as a purely strategic choice.

In the Consumer Goods and FMCG cluster, findings show mixed levels of R&D maturity. For some organisations, innovation was formal and linked to improving product design and recyclability, while for others, it was informal and experimental, and often led by production teams and even suppliers. This echoes Awan et al. (2021), who found that external collaboration supports practical innovation in supply chains. It also links to Bhatia's (2021) idea that proactive strategies make R&D investment more effective, because organisations with clearer sustainability goals seemed more confident in testing new ideas. The finding that R&D was sometimes limited by financial constraints extends the literature by illustrating how organisations adapt GI principles through low-cost, incremental improvements rather than large-scale R&D projects.

In the Retail and Pharmaceuticals cluster, R&D was viewed as collaborative and cross-functional, involving departments such as technology, production, and quality working together to integrate sustainability into projects. This reflects Zhang and Jin (2021), who highlight the role of internal learning and capability building as key mechanisms linking

R&D to long-term innovation performance. Similarly, the emphasis on partnerships and compliance in the findings align with Khanra et al. (2022), who suggest that R&D becomes most valuable when it connects different organisational functions and supports ongoing process improvement.

Overall, the findings reinforce that R&D is important for embedding sustainability into organisational practice. Across industries, R&D was seen not as a separate laboratory function but as an integrated capability that is driven by collaboration, learning, and continuous problem-solving. This supports Bataineh et al. (2024) while extending the literature by showing that in practice, R&D for GI is as much about adaptability and teamwork as it is about technology and investment.

6.2.9.4. *Conclusion of the discussion of the findings for research and development*

The results supported earlier studies that identify R&D as an important driver of GI, helping organisations to improve efficiency, sustainability, and competitiveness (Bataineh et al., 2024; Khanra et al., 2022). In line with Zhang and Jin (2021), the findings also suggest that R&D supports learning and internal capability building, which can, over time, strengthen innovation. Consistent with Awan et al. (2021), collaboration and knowledge sharing appeared to make R&D efforts more effective across teams and partners.

However, the findings also suggest a nuance in how R&D operates within organisations, as shaped by available resources, regulation, and day-to-day realities rather than as a formal department. This nuance may indicate that R&D is often flexible and embedded within everyday work practices, adapting to organisational context and capacity.

There is also an indication that the way R&D is structured and prioritised depends on the availability and management of resources. Limited funding and competing financial priorities often required organisations to improvise and focus on incremental innovations rather than large-scale R&D projects. This nuance highlights that access to funds and the ability to allocate them strategically are key factors that influence how R&D supports GI goals. It also points to the need to view R&D not only as a technical process but as a management practice that relies on leadership commitment, resource balance, and the capacity to adapt under financial constraints. These insights offer a practical perspective on how R&D supports GI in real organisational settings.

Overall, the findings show similarity with existing research that R&D supports GI by improving efficiency, strengthening internal capability, and enabling continuous improvement across teams. The nuance is that R&D in this study often operated in flexible, informal ways shaped by resources, regulation, and day-to-day operations, rather than as a formal department, showing how organisations adapt R&D to fit their context.

6.2.10. Theme 10: External partnership collaboration for GI

6.2.10.1. Recap of findings on external partnership collaboration

This analysis explored how external partnerships shaped the development of GI across industries. The Construction and Building Materials cluster underscored global benchmarking and government collaboration as mechanisms for aligning local capacity with international standards. The Consumer Goods and FMCG cluster positioned partnerships as market-driven, linking supplier co-development to practical sustainability delivery. Retail and Pharmaceuticals participants highlighted partnerships as key in sharing learning and transferring knowledge, while the Papermaking and Recycling Services cluster revealed how multi-stakeholder coordination supported environmental objectives.

These insights demonstrate that partnerships are not peripheral but foundational to embedding sustainability into organisational strategy. They reveal that the most effective innovation happens where partnerships bridge technical expertise and community action, this is no different in the case of GI in advancing sustainability. Partnership quality determines the depth and durability of GI outcomes. Organisations that invest in purposeful and collaborative partnerships are better positioned to enhance their competitiveness and access new markets.

6.2.10.2. Recap of literature on external partnership collaboration

Collaboration has an important role in helping organisations develop GI capabilities. Working together allows organisations to share knowledge, jointly solve problems, and learn from each other in ways that support better sustainability outcomes (Awan et al., 2021; Du et al., 2022; Khan et al., 2023). These collaborative partnerships can improve overall performance, strengthen supply chains, as well as improve competitiveness for all the partners involved. Nonetheless, collaboration needs to be managed carefully. Partners need to be aligned in their goals and values, and they need to understand where the limits of collaboration should be to avoid unproductive outcomes (Baker & Nenonen,

2020; Du et al., 2022). Market shaping builds on collaboration by showing how organisations can go beyond adapting to the market and actively work to influence it. This includes changing market rules, and relationships to support wider sustainability goals (Nenonen et al., 2020). In practice, collaboration supports internal capability-building, while market shaping creates the external conditions that can help sustainability efforts towards reconceiving products and markets for GI succeed.

6.2.10.3. Discussion of the findings with literature on external partnership collaboration

The findings show that external collaborative partnerships are necessary in supporting GI across all clusters, which is aligned with the literature. Other scholars emphasise that collaboration helps organisations share knowledge, solve problems together, and improve sustainability outcomes (Awan et al., 2021; Du et al., 2022; Khan et al., 2023). This is reflected in the Construction and Building Materials cluster, where the findings highlight partnerships with global industry bodies, government entities and specialised agencies as important for benchmarking and learning. This supports the view that collaboration helps organisations access new knowledge and co-create solutions that improve product development and process innovation (Khanra et al., 2022; Xie et al., 2019).

In the Consumer Goods and FMCG cluster, the findings show that partnerships are used to meet customer expectations and differentiate their products. The literature explains that organisations use market orientation strategies and collaboration to understand changing customer needs and redesign products with sustainability in mind (Bhatia, 2021; Varadarajan et al., 2022). The findings also reflect this perspective through accounts of co-developing products with suppliers, experimenting with new materials, and reducing packaging waste reflect this perspective. These examples support the idea that collaborative networks can help organisations embed sustainability into product lifecycles and respond quickly to market demands (Awan et al., 2021; Du et al., 2022).

In the Retail and Pharmaceuticals cluster, partnerships appeared even more structured, and accountability focused. The findings emphasise compliance audits, engagement with ethical sourcing agencies, and participation in industry forums. This aligns with research that highlights collaboration as a way to strengthen supply chain transparency and support market shaping activities (Baker & Nenonen, 2020; Nenonen et al., 2020). The literature also notes that organisations need to work with partners who share their values and objectives to prevent unproductive collaboration (Du et al., 2022), a point

directly reflected in the findings through the emphasis on value alignment and careful partner selection.

The findings from the Papermaking and Recycling Services cluster add an nuance by highlighting community partnerships. While the literature focuses mainly on supply chain and market-level collaboration, the findings suggest that some organisations extend collaboration to local stakeholders for a shared benefit and GI outcome. This offers a possible extension to current discussions by showing that community-level engagement may have a role in GI where environmental and social aims intersect.

At the same time, the findings point to limitations that the literature may only partially reflect. While previous studies caution against over-collaboration and diluted focus (Du et al., 2022; Cooper, 2021), the findings also point to more practical challenges, such as limited in-house expertise and the reliance on external consultants to fill capability gaps. In some cases, collaboration was driven by necessity rather than strategy. This nuance suggests that, although collaboration has clear benefits, its effectiveness depends on organisational capacity, resource availability, and alignment with broader GI goals.

Overall, the findings support much of the existing literature while also adding practical insight into how different industries experience collaboration in day-to-day operations.

6.2.10.4. Conclusion of the discussion of the findings for external partnership collaboration

The discussion suggests that external partnerships have an important role in supporting GI, and this aligns with much of the existing literature. Similar to Awan et al. (2021), Du et al. (2022) and Khan et al. (2023), the findings show that partnerships can help organisations share knowledge, strengthen capabilities, and respond more effectively to sustainability demands. The results also appear to support the idea that collaboration helps organisations adapt their products, improve processes, and meet changing environmental expectations.

At the same time though, the findings add nuance by showing that partnerships operate differently across industries and organisational contexts. For some organisations, partnerships seem strategic and growth-oriented, while for others they appear more practical, compliance-driven, or shaped by local needs. This nuance suggests that collaboration is not a uniform process and may be influenced by external pressures, available resources, as well as organisational priorities. It also hints that community-level partnerships may contribute to GI in sectors where environmental and social goals intersect.

The findings also point to practical constraints. Limited internal expertise, reliance on consultants, as well as uneven partner alignment all influence how effective collaboration can be. These insights highlight that external partnership collaboration supports GI, but its success depends on context, capacity, and careful management.

Overall, the findings show similarity with existing research that external partnerships support GI by strengthening knowledge sharing, capability building, and collaborative improvement. The nuance is that partnerships in this study operated differently across industries, and were shaped by resource availability and compliance demands, and local community needs. This indicates that while collaboration is widely beneficial, its form and effectiveness depend on organisational context and capacity, extending the literature by showing that partnership models are not uniform but adapt to sector realities.

6.2.11. Theme 11: Brand positioning for GI

6.2.11.1. Recap of findings on brand positioning

In general, participants were similar in that brand positioning and consumer education are key enablers of GI. The findings show that while organisations approach

sustainability communication differently, they share a belief that awareness and transparency shape how consumers and stakeholders respond to new environmental solutions. Participants agreed that awareness and trust form the foundation of how green products gain acceptance. Branding was not described as a marketing exercise but as a process of education and transparency.

Construction and Building Materials and Consumer Goods and FMCG participants viewed education as a way to conscientise people and bridge the gap between awareness and behaviour, while retail participants demonstrated how visible and convenient actions make sustainability more accessible. In the Papermaking and Recycling Services cluster, only one participant spoke about brand perception. They highlighted credibility and visible action over promotion, arguing that people need to see sustainability being practiced, not just talking about it.

These insights highlight that effective brand positioning extends beyond promotion; it builds legitimacy through transparency and consumer empowerment through education. Organisations that align genuine sustainability practice with clear and relatable communication

6.2.11.2. Recap of literature on brand positioning

To conclude, green product innovation and market reconception work together to help organisations rethink what they offer and how they connect with customers. Green product innovation enables organisations to redesign products in ways that reduce environmental impact while improving design quality as well as performance (Qiu et al., 2020; Appiah & Essuman, 2024). However, these product improvements only create real value when supported by strong internal systems and credible sustainability practices, ensuring that product claims are aligned with how the organisation operates (Shahzad et al., 2021; Xie et al., 2019).

At the same time, the literature highlights the importance of rethinking markets. In contexts where customer awareness is limited, green marketing innovation becomes essential for helping consumers understand the value of green products (Appiah & Essuman, 2024). Organisations need to educate customers and communicate clearly so that customers can interpret green product benefits meaningfully. Trust has a strong influence on financial outcomes, because green product innovation performs better when customers believe in an organisation's environmental commitment (Xie et al., 2019). These ideas suggest that organisations achieve stronger and more consistent results

when green product innovation, internal capability-building, and strategic communication are developed in a connected and mutually reinforcing way (Appiah & Essuman, 2024; Xie et al., 2019). These insights show how organisations not only redesign products but also rethink how they engage with their markets through education, communication, and credibility-building. This combination of green product innovation, internal capability development, and market reconception directly informs how organisations can reconceive both their offerings and their market positioning for sustainability. In this way, the discussion offers clear grounding for RQ3, which examines how organisations use their resources and capabilities to reshape products and markets through GI.

6.2.11.3. Discussion of the findings with literature on brand positioning

The findings align strongly with the literature in showing that customer perception, awareness, and education are important in shaping how green products are understood and accepted in the market. Similar to Appiah and Essuman's (2024) emphasis on education-driven market reconception, the findings indicate that consumers often require guidance to understand green product benefits. In the Construction and Building Materials cluster, the findings also highlight the need to "subtly manage" customer mindsets or introduce changes gradually, which reflect the idea that organisations must actively guide customer understanding rather than wait for awareness to grow on its own (Appiah & Essuman, 2024). This pattern repeats in the Retail and Pharmaceuticals cluster, where the findings show that labelling, communication, and in-store messaging help steer customer choices, which is also consistent with Appiah and Essuman's (2024) argument that organisations must take an educator role when awareness is low.

The findings also support the view from Xie et al. (2019) and Shahzad et al. (2021) that a strong environmental reputation strengthens brand positioning and enhances trust. Across the Consumer Goods and FMCG and Retail and Pharmaceuticals clusters, the findings highlight authenticity, long-term values, quality assurance, and responsible sourcing as essential contributors to their organisation's reputation. This closely reflects Xie et al.'s (2019) notion of green image, where customer trust and belief in an organisation's environmental commitment shape financial performance. The emphasis on reputational risk, scrutiny, and the need for consistency in the findings suggests an understanding of green image that extends beyond marketing claims, aligning with literature that stresses the importance of internal practices underpinning product-level claims (Shahzad et al., 2021).

Despite these similarities, there are notable nuances where the findings add some depth to the literature. While research emphasises strategic market reconception and proactive marketing innovation, the findings across several clusters describe a more reactive and practical reality. For example, some customers still resist green products due to cost or comfort with traditional options. This shows that awareness does not automatically translate into behaviour. Additionally, while the literature presents green marketing innovation as a strategic tool, the findings from the Consumer Goods and FMCG and Retail and Pharmaceuticals clusters show that marketing is sometimes dialled back intentionally because consumer interest varies. This indicates that organisations adjust communication efforts based on market readiness.

Furthermore, while the literature stresses synergy between green product innovation and green marketing innovation (Appiah & Essuman, 2024), the findings show that some organisations deliberately prioritise operational integrity before investing heavily in communication. This sequencing nuance where organisations may pursue internal sustainability work first and only elevate messaging later, is not strongly emphasised in existing studies.

Overall, while the literature provides a structured view of how GI and brand positioning should work, the findings suggest that organisations may need to be more deliberate about how they use communication, rather than only reacting to what the market is ready for. The results show that some organisations hold back on communication because consumer interest varies, yet the literature emphasises that educating customers, shaping perceptions, and guiding understanding are important for closing the gap between awareness and action (Appiah & Essuman, 2024; Xie et al., 2019). This suggests that organisations should not wait for the market to catch up, but instead take advantage of communication as a strategic tool to build understanding, influence customer thinking, and strengthen their green positioning. These findings suggest that while organisations recognise the value of communication, many still treat it as a response to market readiness rather than as a tool to shape it, which creates a gap that strategic communication could help close.

6.2.11.4. *Conclusion of the discussion of the findings for brand positioning*

The findings suggest that customer perception and education are important to how green products are understood and accepted by the market, which supports the argument made by Appiah and Essuman (2024). Although awareness of sustainability is increasing, the findings suggets that many consumers still need clear guidance to

interpret green product benefits. This emphasises that organisations should not wait for the market to adjust on its own but take a more proactive role in shaping customer understanding through communication and consistent messaging, thus position their brands as green.

The findings also reinforce the view from Xie et al. (2019) and Shahzad et al. (2021) that trust, authenticity, and a credible environmental reputation strengthen brand positioning. At the same time, the study highlights that organisations sometimes reduce communication efforts when consumer interest is uncertain, which may limit their ability to build demand or shift behaviour. These insights suggest that stronger and more deliberate communication strategies may help organisations translate green product innovation into clearer market acceptance and long-term competitiveness (Appiah & Essuman, 2024; Xie et al., 2019).

Overall, the findings show similarity with existing literature that customer education, trust, and a credible environmental reputation are important to effective green brand positioning. The nuance lies in how organisations manage communication in practice. Unlike the literature's proactive view, some organisations hold back or adjust messaging based on market readiness, which can limit impact. This suggests that while organisations recognise the value of guiding customer understanding, communication is not always used strategically to build demand and strengthen their green positioning.

6.3. Conclusion

In summary, Table 20 shows how the themes and subthemes relate to the existing literature, highlighting where they align and where a nuance of difference suggests potential refinement. The green highlights indicate nuance of difference that emerged during the comparison findings with literature and were not linked to the previously identified subthemes. These nuances have been recorded as new subthemes arising from Chapter 6 discussion and are additional to what was previously presented as subthemes in Section 5.6 of Chapter 5. Subsequently, these are presented as new subthemes in the final amended conceptual framework (Figure 7).

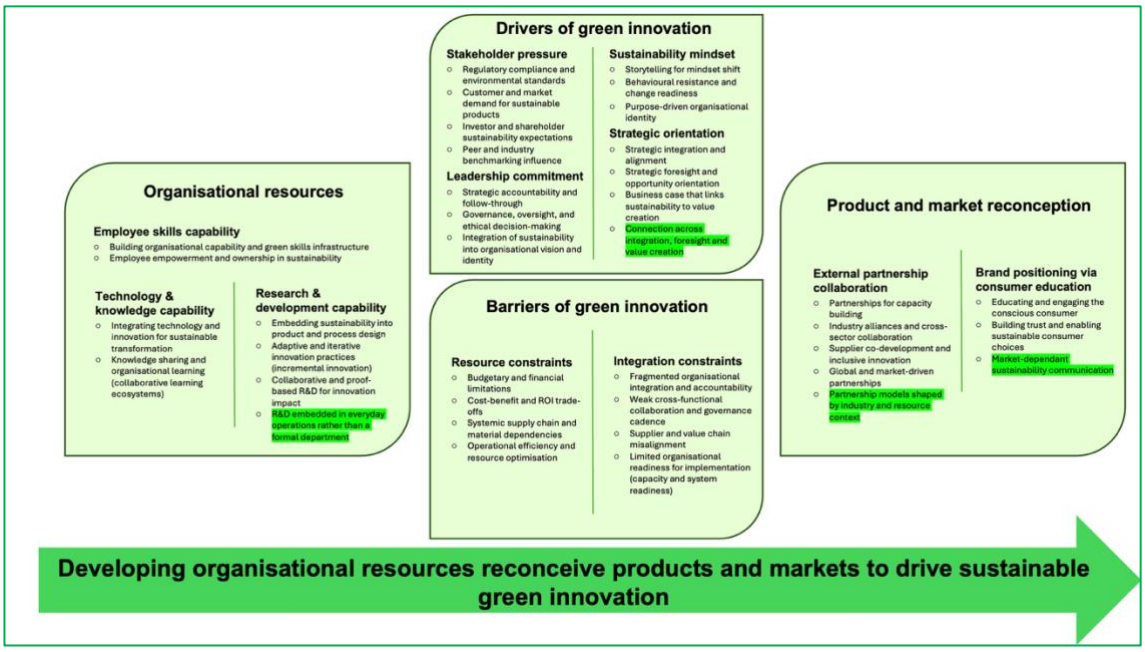
Table 20: Summary of literature comparison outcomes

Constructs	Theme	Subtheme	Similarity or nuance of difference	Outcome
Green innovation (drivers)	Stakeholder pressure	○ Regulatory compliance and environmental standards	Similarity	Add to current literature
		○ Customer and market demand for sustainable products	Similarity	Add to current literature
		○ Investor and shareholder sustainability expectations	Similarity	Add to current literature
		○ Peer and industry benchmarking influence	Similarity	Add to current literature
	Leadership commitment	○ Strategic accountability and follow-through	Similarity	Add to current literature
		○ Governance, oversight, and ethical decision-making	Similarity	Add to current literature
		○ Integration of sustainability into organisational vision and identity	Nuance of difference	Potential refinement
	Sustainability mindset	○ Storytelling for mindset shift	Nuance of difference	Potential refinement
		○ Behavioural resistance and change readiness	Similarity	Add to current literature
		○ Purpose-driven organisational identity	Nuance of difference	Potential refinement
	Strategic orientation	○ Strategic integration and alignment	Similarity	Add to current literature
		○ Strategic foresight and opportunity orientation	Similarity	Add to current literature
		○ Business case that links sustainability to value creation	Similarity	Add to current literature
		○ Connection across integration, foresight and value creation	Nuance of difference	Potential refinement
Green innovation (barriers)	Resource constraints	○ Budgetary and financial limitations	Similarity	Add to current literature
		○ Cost-benefit and ROI trade-offs	Similarity	Add to current literature

		○ Systemic supply chain and material dependencies	Similarity	Add to current literature
		○ Operational efficiency and resource optimisation	Similarity	Add to current literature
	Integration constraints	○ Fragmented organisational integration and accountability	Similarity	Add to current literature
		○ Weak cross-functional collaboration and governance cadence	Similarity	Add to current literature
		○ Supplier and value chain misalignment	Similarity	Add to current literature
		○ Limited organisational readiness for implementation (capacity and system readiness)	Similarity	Add to current literature
Organisational resource	Employee skills	○ Building organisational capability and green skills infrastructure	Similarity	Add to current literature
		○ Employee empowerment and ownership in sustainability	Similarity	Add to current literature
	Technology and knowledge management	○ Integrating technology and innovation for sustainable transformation	Similarity	Add to current literature
		○ Knowledge sharing and organisational learning (collaborative learning ecosystems)	Similarity	Add to current literature
	Research and development	○ Embedding sustainability into product and process design	Similarity	Add to current literature
		○ Adaptive and iterative innovation practices (incremental innovation)	Similarity	Add to current literature
		○ Collaborative and proof-based R&D for innovation impact	Similarity	Add to current literature
		○ R&D embedded in everyday operations rather than a formal department	Nuance of difference	Potential refinement
	External partnership collaboration	○ Partnerships for capacity building	Similarity	Add to current literature
		○ Industry alliances and cross-sector collaboration	Similarity	Add to current literature

		○ Supplier co-development and inclusive innovation	Similarity	Add to current literature
		○ Global and market-driven partnerships	Similarity	Add to current literature
		○ Partnership models shaped by industry and resource context	Nuance of difference	Potential refinement
	Brand positioning	○ Educating and engaging the conscious consumer	Similarity	Add to current literature
		○ Building trust and enabling sustainable consumer choices	Similarity	Add to current literature
		○ Market-dependant sustainability communication	Nuance of difference	Potential refinement

Figure 7: Final amended conceptual framework



Source: Author's own

7. Chapter 7: Conclusion

7.1. Introduction

The aim of this chapter is to present the research outcomes based on the discussion presented in Chapter 6. Its purpose is to show how the findings relate to the aims of the research and the questions the study set out to answer.

The study aimed to explore how companies develop ORs to reconceive products and markets to drive sustainable GI. To guide this, the research explored three key questions. The first looked at the internal and external factors that drive or restrict companies in building ORs for sustainable GI. The second considered how companies create and use ORs to advance their GI efforts. The third explored how developing and applying these resources enables organisations to rethink their products and markets with sustainability in mind.

The chapter revisits each of these RQs by summarising the main outcomes linked to them. This allows the findings of the study to be viewed alongside existing literature, showing where the results support what is already known and where they offer potential refinements to literature.

The chapter then outlines the contributions of the research and sets out practical recommendations for those who may benefit from the work. It also reflects on the limitations of the study and offers ideas for future research.

7.2. Principal theoretical conclusions

RQ1: What internal and external factors drive or hinder companies in developing organisational resources for sustainable green innovation?

Similarities

Across the findings, organisations expressed that the main drivers of GI are consistent with what the literature describes. Stakeholder pressure continued to be a strong motivator, particularly the influence of customers, regulators, investors and shareholders. This aligns with Xie et al. (2019) and Wang and Juo (2021) who emphasise that stakeholder demands push organisations to reconfigure resources to support sustainability (Singh et al., 2021). Competitive pressure also appeared across several

organisations, reflecting the argument by Madrid Guijarro and Duréndez (2023) that the desire to remain competitive encourages GI.

Leadership commitment was another shared internal driver. Leaders set the tone, allocate resources and help clarify the strategic importance of sustainability. This is consistent with Khanra et al. (2022) and Bhatia (2021) who observe that leadership support enables the development of ORs required for sustainability.

There was also a shared recognition that a sustainability mindset within the organisation creates an environment that encourages green thinking. Organisations described how internal values, culture and long-term thinking supported the adoption of green practices. This aligns with Aftab et al. (2022) who identify green culture and employee engagement as important drivers that shape organisational readiness for sustainability. Strategic orientation was also consistent across organisations. There was recognition that sustainability increasingly forms part of organisational value creation and long-term planning, which aligns with literature that positions sustainability as a strategic lever (Varadarajan et al., 2022).

The organisations also reported similar barriers. Resource constraints such as limited funding, time pressures and cost sensitivities emerged across sectors. This reflects Wang and Juo (2021) who note that organisations often face difficulties balancing sustainability ambitions with operational constraints. Integration challenges, including fragmented processes, limited cross functional coordination and inconsistent accountability, also appeared consistently. This aligns with literature that describes the complexity of embedding sustainability across organisational systems and value chains (Wiredu et al., 2024).

Nuance of difference

Although the findings reflect much of what is already known, there are several nuances that differ from the literature. Leadership commitment had interesting nuanced differences. In some organisations, leadership was values driven and prioritised sustainability beyond compliance, while in others leadership was mainly concerned with costs or commercial justification. This variation suggests that leadership influence is more complex and is shaped by organisational history, industry demands and strategic focus.

The sustainability mindset theme also presented unique differences. Some organisations saw sustainability as an ethical responsibility, while others framed it as a commercial opportunity or as part of efficiency improvement. This adds nuance to literature that often treats sustainability mindset as a single cultural construct, suggesting instead that it is shaped by organisational context and purpose.

Strategic orientation showed similar variation. Some organisations had a clear long-term strategic vision for sustainability and saw it as fundamental to future competitiveness. Others treated sustainability as an emerging consideration that still required balancing with short term operational demands. This suggests that while SO is broadly aligned with literature, the depth of integration varies across organisations (Wu et al., 2024).

There were no nuanced differences with the resource and integration constraints.

RQ2: How companies build and leverage organisational resources and dynamic capabilities to support green innovation initiatives?

Similarities

The findings showed that organisations rely heavily on internal skills, knowledge and technologies to build the capabilities needed for GI. This closely echoes the DC literature which stresses that internal competencies form the backbone of GI (Khan et al., 2023). Employee skills and collaboration were consistently identified as important ingredients to capability development. Organisations relied on employee expertise, shared learning and coordinated teamwork to support the development of green solutions. This reflects Aftab et al. (2022) who highlight that employees contribute directly to the operationalisation of sustainability through knowledge sharing and behavioural alignment. It also aligns with Khanra et al. (2022) who underscore that sustainable innovation requires coordinated internal effort and employee involvement to succeed.

Technology and knowledge management capabilities were also widely recognised across organisations as essential to GI. This aligns with Bhatia (2021) who highlights the importance of knowledge acquisition and technological resources in facilitating environmentally responsible innovation. Organisations emphasised the importance of identifying, acquiring and adapting technologies that meet sustainability needs. They also highlighted the ongoing need to manage knowledge effectively so that learning can be transferred across teams and functions. This is consistent with Kortus and Gutmann

(2023) who note that knowledge and technology form the foundation for sustainable capability building.

R&D activity appeared across organisations as a mechanism for experimentation and testing. Organisations used R&D to evaluate materials, refine processes as well as explore new approaches that align with their sustainability goals. This aligns with literature that sees R&D as core to capability enhancement, particularly when innovation requires technical development or iterative learning (Bataineh et al., 2024).

These similarities show that capability building for GI involves a combination of skills development, technological readiness and structured experimentation.

Nuance of difference

The findings revealed a nuanced difference in how organisations build and apply these capabilities, particularly with R&D. Unlike the literature, which often presents R&D as a formal, structured function (Bataineh et al., 2024), the findings show that R&D is frequently embedded in day-to-day operations and shaped by resource constraints, regulatory demands, and practical realities. This suggests that organisations adapt R&D to fit context and capacity, this is a potential refinement to the scholarship.

RQ3: In what ways the development and deployment of organisational resources enable companies to reconceive their products and markets for sustainability?

Similarities

The findings support existing literature that ORs play a direct role in helping organisations reconceive products and markets. As Khanra et al. (2022) and Xie and Zhu (2020) argue, organisations that develop internal capabilities are better positioned to create sustainable products and respond to market expectations. Across sectors, organisations described how improved resources, such as skilled employees, focused leadership, and integrated sustainability strategies, helped them understand new opportunities and recognise areas where they could innovate.

External partnerships were widely recognised as critical enablers of GI and market reconception. Organisations relied on partners to strengthen technical knowledge, enhance operational capacity, and access new insights across the value chain. This aligns with the literature which highlights partnerships as important sources of capability enhancement and innovation support (Awan et al., 2021; Khan et al., 2023). The study

showed that partnerships functioned as channels for knowledge exchange, resource sharing and collaborative problem solving, which enabled organisations to expand their sustainability efforts beyond what could be achieved internally.

Brand positioning also emerged as a consistent mechanism through which organisations translated their sustainability efforts into market engagement. Many organisations recognised that building a credible sustainability brand required transparency, education and ongoing communication with stakeholders (Appiah & Essuman, 2024). This supports Szabo and Webster (2021) who argue that sustainability related positioning influences consumer trust and strengthens market legitimacy. Although a number of organisations used sustainability to differentiate themselves and appeal to conscious consumers, others did not position themselves in this way and instead approached sustainability more conservatively, focusing on operational improvement or compliance.

Overall, the similarities across organisations support the view that the deployment of ORs enables both strategic collaboration and market facing communication, which are essential to reconceiving products and markets for sustainability.

Nuance of difference

Although organisations shared common patterns, there were meaningful differences in how they used partnerships and brand positioning to shape their products and markets. External partnerships differed in purpose, depth and strategic intent. Some organisations relied on partners to support technical capability building and innovation, such as co-developing sustainable materials or improving recycling processes. Others used partnerships mainly for compliance, capacity building or supply chain alignment. In some cases, partnerships enabled access to global expertise, while in others they strengthened local implementation and operational support. These differences show that partnerships do not produce uniform outcomes, rather, they influence market reconception based on industry needs, resource availability and the organisation's SO.

Brand positioning also varied across organisations. Some organisations placed an emphasis on consumer education and used communication to influence customer choices. This reflects a strategy focused on market leadership and differentiation. Others were more cautious and emphasised credibility through measurable action rather than messaging, particularly in industries where customer expectations were conservative or where reputational risk was high. These differences suggest that sustainability

positioning is influenced by market maturity, customer values and perceptions of strategic risk.

Overall, the nuances show that while organisations use similar approaches to reconceive products and markets, the way these approaches unfold is shaped by sector context, capability maturity and organisational priorities.

7.3. Research contribution

The purpose of this study was to explore how companies develop ORs to reconceive products and markets to drive sustainable GI. It aimed to contribute to the growing but still evolving literature on organisational GI by examining how organisations interpret, apply, and operationalise sustainability within real organisational contexts, particularly to reconceive products and markets to drive sustainable GI. The contributions are presented in two categories:

- Additions to the existing literature (similarities with literature), and
- Potential refinements to the existing literature (nuances of difference).

7.3.1. Additions to existing literature

Based on the discussion of the findings, several subthemes show alignment with existing literature and therefore contribute by adding to what is already known about GI. These are summarised in Table 20 and reflect areas where the study supports established theoretical perspectives. The similarities suggest that existing GI frameworks remain applicable, even as this study was conducted in a different national, sectoral, and organisational context.

Table 21: Potential additions to existing literature

Constructs	Theme	Subtheme
Green innovation (drivers)	Stakeholder pressure	○ Regulatory compliance and environmental standards
		○ Customer and market demand for sustainable products
		○ Investor and shareholder sustainability expectations
		○ Peer and industry benchmarking influence

	Leadership commitment	○ Strategic accountability and follow-through
		○ Governance, oversight, and ethical decision-making
		○ Integration of sustainability into organisational vision and identity
	Sustainability mindset	○ Behavioural resistance and change readiness
	Strategic orientation	○ Strategic integration and alignment
		○ Strategic foresight and opportunity orientation
		○ Business case that links sustainability to value creation
Green innovation (barriers)	Resource constraints	○ Budgetary and financial limitations
		○ Cost-benefit and ROI trade-offs
		○ Systemic supply chain and material dependencies
		○ Operational efficiency and resource optimisation
	Integration constraints	○ Fragmented organisational integration and accountability
		○ Weak cross-functional collaboration and governance cadence
		○ Supplier and value chain misalignment
		○ Limited organisational readiness for implementation (capacity and system readiness)
Organisational resource	Employee skills	○ Building organisational capability and green skills infrastructure
		○ Employee empowerment and ownership in sustainability
	Technology and knowledge management	○ Integrating technology and innovation for sustainable transformation
		○ Knowledge sharing and organisational learning (collaborative learning ecosystems)
	Research and development	○ Embedding sustainability into product and process design
		○ Adaptive and iterative innovation practices (incremental innovation)
		○ Collaborative and proof-based R&D for innovation impact
	External partnership collaboration	○ Partnerships for capacity building
		○ Industry alliances and cross-sector collaboration

		○ Supplier co-development and inclusive innovation
		○ Global and market-driven partnerships
	Brand positioning	○ Educating and engaging the conscious consumer
		○ Building trust and enabling sustainable consumer choices

7.3.2. Potential refinements to existing literature

Other subthemes revealed nuances of difference, which offer potential refinements to existing theoretical perspectives on GI. These nuances are summarised in Table 20. Crane et al. (2016) highlight that refining theory is considered a contribution to scholarship because it helps redefine core concepts by adapting frameworks, that may often be developed in western contexts, to different national and organisational contexts. As such, this study's empirical insights, which are from an emerging economy, offer such a potential refinement, ensuring the discourse on GI is more robust and applicable beyond its original, often Western-centric, formulation.

Table 22: Potential refinements to existing literature

Constructs	Theme	Subtheme
Green innovation (drivers)	Leadership commitment	○ Integration of sustainability into organisational vision and identity
	Sustainability mindset	○ Storytelling for mindset shift
		○ Purpose-driven organisational identity
	Strategic orientation	○ Connection across integration, foresight and value creation
Organisational resource	Research and development	○ R&D embedded in everyday operations rather than a formal department
	External partnership collaboration	○ Partnership models shaped by industry and resource context
	Brand positioning	○ Market-dependant sustainability communication

7.4. Recommendations for management and other stakeholders

RQ1: What internal and external factors drive or hinder companies in developing organisational resources for sustainable green innovation?

Managers should begin by turning stakeholder pressure into a clear roadmap. This means identifying the key stakeholders that most influence the organisation. Understanding their top expectations, and translate these into resource priorities. Visible leadership commitment is also essential. The senior managers should have sustainability targets built into their performance reviews, and leaders should regularly explain decisions that involve balancing cost and sustainability so that employees see that these choices are treated seriously.

Shaping a genuine sustainability mindset requires more than policies that people do not read. Managers can use storytelling via internal marketing to connect sustainability to the organisation's purpose and history, and they should highlight small achievements to reduce resistance and build confidence in ongoing change. Sustainability also needs to be part of core strategy rather than an add-on, which means applying sustainability criteria in capital allocation, product design and supplier decisions, as well as requiring every major business case to show its sustainability impact.

Resource constraints should be managed deliberately by protecting a modest annual budget and time allocation for GI. This can be started with focused pilots to build credibility. Additionally, managers should address integration challenges by creating cross-functional forums with clear decision rights and assigning responsibility for sustainability metrics within each function.

For boards, embedding sustainability into risk and strategy committees and linking executive rewards to progress will strengthen long-term alignment.

RQ2: How companies build and leverage organisational resources and dynamic capabilities to support green innovation initiatives?

Managers should strengthen sustainability-related skills in areas where they are most relevant to the organisation's work. This includes identifying the specific knowledge or competencies needed in each function and creating simple learning pathways to support them. Cross-functional collaboration is also important for GI. Managers can create small,

mixed teams drawn from operations, finance, marketing and supply chain to work on focused initiatives, supported by regular learning reviews that help groups reflect on progress and share insights. Knowledge should be handled as a strategic resource by capturing lessons from projects in accessible formats and storing them in shared platforms so that teams can easily re-use examples, tools and supplier information.

Technology choices should align with sustainability aims through a simple roadmap that outlines which tools support emissions reduction, resource efficiency or product redesign, with both technical and business users contributing to these decisions. Managers should also recognise that innovation activity often takes place within day-to-day operations, and provide modest time and budgets for experiments and pilots. Even informal experimentation should follow a basic structure, defining the purpose, measures and learning before scaling what proves viable. Sharing clear stories about how these efforts reduce risks, cut costs or create opportunities will help protect GI resources.

For human resource and learning and development teams, integrating sustainability-related skills into training and leadership development will support capability building across the organisation.

RQ3: In what ways the development and deployment of organisational resources enable companies to reconceive their products and markets for sustainability?

Managers can make better use of ORs by involving a range of internal teams when exploring new product or market opportunities. Frontline staff, technical specialists and sustainability teams each hold different insights, and structured workshops can help identify how existing products might be redesigned for lower environmental impact or tailored to emerging green segments. Partnerships should also be approached strategically. Rather than forming broad or unfocused collaborations, managers can build a small portfolio of partnerships that serve specific purposes, whether technical co-development, compliance support or local implementation, supported by clear roles, knowledge-sharing arrangements and success measures.

Partnerships should fit the organisation’s context. When resources are limited, partnerships that share infrastructure, skills or data may be most effective, while highly regulated or high-risk sectors benefit from collaborations that strengthen credibility and compliance. Brand positioning should go beyond promoting products and instead recognise the organisation’s wider role in shaping how people think about sustainability.

Because everyday exposure strongly influences behaviour, organisations have an opportunity and a responsibility to guide customers towards more sustainable choices through the products they design and the messages they share. This means aligning sustainability communication with genuine organisational capability, while also using the brand to encourage new norms and expectations that support long-term environmental wellbeing. In markets that are already receptive, transparent storytelling and education can help shift consumer understanding and make sustainable choices feel more natural. In markets that are more cautious, organisations can still influence for good by focusing on credible evidence, reliable performance and honest explanations of trade-offs, gradually building trust and subtly reshaping how customers view sustainability. Instead of using influence purely for profit, organisations can position their brands as agents of positive behavioural change, helping customers see sustainable products as desirable, accessible and aligned with their values.

For marketing and communication teams, close collaboration with technical and sustainability colleagues is essential to ensure credible and context-appropriate messaging.

7.5. Limitations of the research

Chapter 4 already covers the limitations linked to how the study was designed and carried out. This section focuses on the broader limitations of the study as a whole. These reflect the scope and boundaries of what the research was able to explore (Bloomberg & Volpe, 2012).

- The research was conducted within the South Africa context.
- In this study, individual sectors were not explored in great depth and further studies could look into further sector-level experiences.
- The nuances of difference that were identified within the study were not further explored since they emerged as findings rather than predefined areas of inquiry.

7.6. Suggestions for future research

- Green innovation is an emerging topic. This study therefore did not restrict its focus to specific sectors but instead explored the experiences of any organisation in South Africa with environmentally sustainable objectives. Future research could examine

particular sectors in greater depth, for example, investigating how GI unfolds within the retail or pharmaceuticals sectors, to provide more detailed, industry-specific insights. Such sector-focused studies would extend the contextual insights generated in this research.

- The study highlighted that mindset plays an important role in how sustainability becomes embedded in organisational practice. However, the mechanisms through which a sustainability mindset is shaped, reinforced, and diffused across different organisational levels remain underexplored. Future research could examine how leadership behaviours, organisational narratives, learning processes, and cultural factors collectively influence mindset formation and how these affect the adoption and institutionalisation of GI.
- Several nuances emerged during the comparison between findings and existing literature, such as flexible, embedded forms of R&D; context-driven partnership models; and the selective use of communication in brand positioning. These were not predefined areas of inquiry but appeared inductively through the analysis. Future studies could explore these nuances as dedicated research topics to refine and extend existing theoretical perspectives on GI, particularly in emerging-economy contexts.

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APPENDIX A

- Research instrument -

Appendix A: Interview guide

1. Please can you briefly explain your role and involvement with sustainability in your organisation?

2. Please tell me about your organisation's approach to sustainability and green innovation (environmental sustainability)?

3. Could you tell me about the internal and external factors that you understand have motivated your organisation to develop resources for sustainable green innovation?

4. To the best of your knowledge, can you tell me how your organisation builds and enhances the capabilities and resources necessary for green innovation?

5. In your experience, how does your organisation then leverage these capabilities and resources most effectively to support green innovation initiatives?

6. Based on your understanding, how has your organisation developed and used resources to rethink the way you design products or approaches new markets for sustainability?

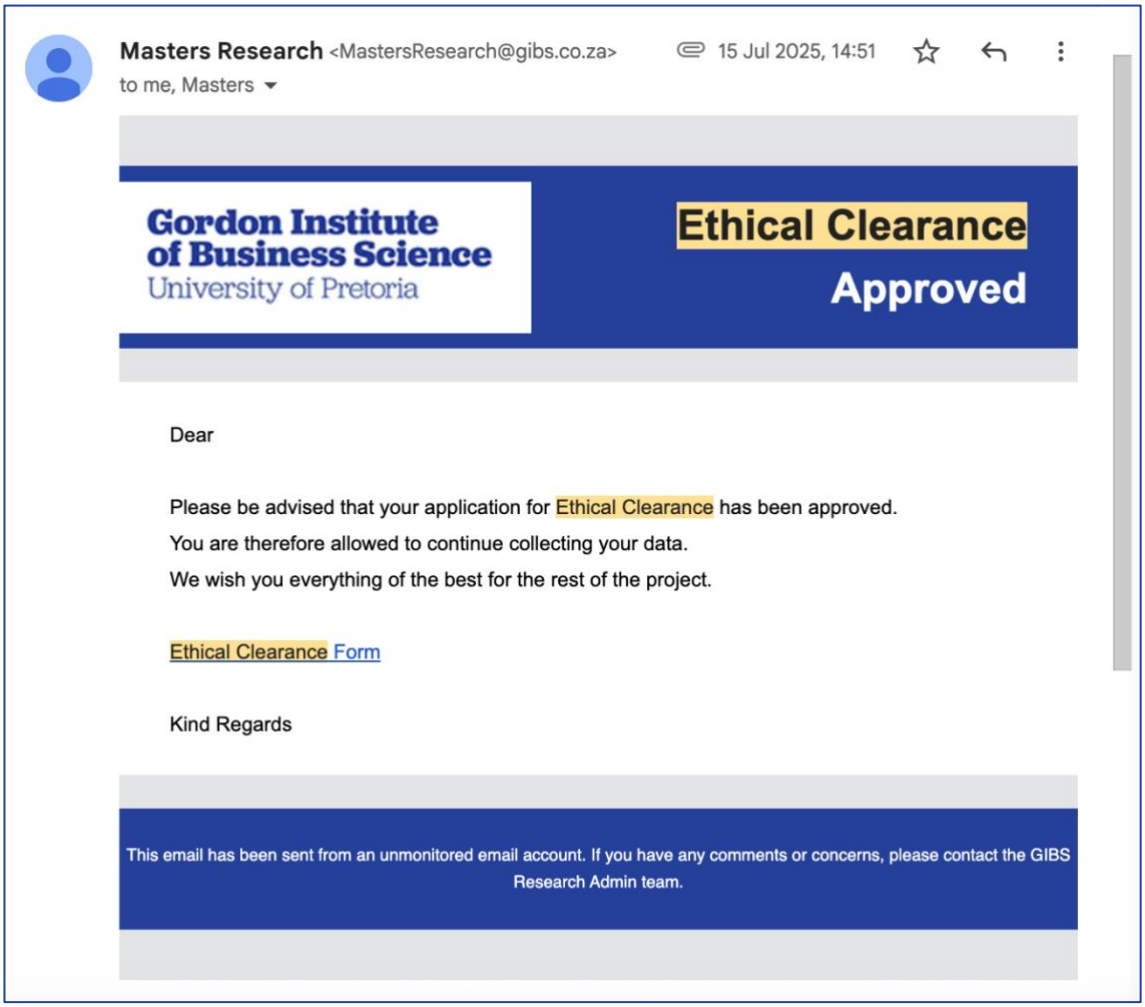
7. In your experience, does your organisation face any challenges or barriers in deploying resources toward sustainable product and market transformation?

8. Looking ahead, how do you see green innovation going forward?

APPENDIX B

- Ethical clearance approval -

Appendix B: Ethical clearance approval



Masters Research <MastersResearch@gibs.co.za> 15 Jul 2025, 14:51

to me, Masters

Gordon Institute of Business Science
University of Pretoria

Ethical Clearance Approved

Dear

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 C
- Analysis process sample -

Appendix C: Sample of moving from first-order codes to construct

A	B	C	D	E
First Order Code	First Order Category	Theme	Research Question	Construct
Financial institutions' accountability	Access to green finance and funding	Stakeholder Pressure x Green Innovation	RQ1	
Sustainable business educating government	Collaborative innovation and policy partnership	Stakeholder Pressure x Green Innovation	RQ1	
Innovating because of social challenges	Community and social licence pressures	Stakeholder Pressure x Green Innovation	RQ1	
Licence to operate	Community and social licence pressures	Stakeholder Pressure x Green Innovation	RQ1	
Socio-economic considerations for sustainability	Community and social licence pressures	Stakeholder Pressure x Green Innovation	RQ1	
Import impeding competitiveness	Competition pressure	Stakeholder Pressure x Green Innovation	RQ1	
Players in the game just for money	Competition pressure	Stakeholder Pressure x Green Innovation	RQ1	
Challenge - unregulated exports	Competitor pressure	Stakeholder Pressure x Green Innovation	RQ1	
Keeping abreast with your competitors	Competitor pressure	Stakeholder Pressure x Green Innovation	RQ1	
Unscrupulous competitors	Competitor pressure	Stakeholder Pressure x Green Innovation	RQ1	
Corporate responsibility in sustainability	Corporate responsibility compliance	Stakeholder Pressure x Green Innovation	RQ1	
Cradle to grave responsibility	Corporate responsibility compliance	Stakeholder Pressure x Green Innovation	RQ1	
Environmental responsibility	Corporate responsibility compliance	Stakeholder Pressure x Green Innovation	RQ1	
Aiming for meeting customer expectations	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	Green innovation
Commercial viability of sustainable products	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Customer acceptance of green products matters	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Customer holding business accountable	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Customer keeping us honest (some)	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Customer preferences	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Customer priority differs for sust interest/not	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Customer type = customer interest	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Customer type range - interest and no interest	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Diverse customer base	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
Voluntary SBTI reporting driven by customer demand	Customer demand for sustainable products	Stakeholder Pressure x Green Innovation	RQ1	
External factors influence priority	External factors influence priority	Stakeholder Pressure x Green Innovation	RQ1	
External stakeholder considerations influence	External factors influence priority	Stakeholder Pressure x Green Innovation	RQ1	
Factors influencing sustainability	External factors influence priority	Stakeholder Pressure x Green Innovation	RQ1	
South Africa was leading subsidy benefits for decarbonisation	Government incentives and support	Stakeholder Pressure x Green Innovation	RQ1	
Government sourcing not matching their policies	Governmental shortsight	Stakeholder Pressure x Green Innovation	RQ1	
Benchmarking with best in class	Industry and peer benchmarking influence	Stakeholder Pressure x Green Innovation	RQ1	
Benchmarking within industry	Industry and peer benchmarking influence	Stakeholder Pressure x Green Innovation	RQ1	
Customer influence on outcomes	Industry and peer benchmarking influence	Stakeholder Pressure x Green Innovation	RQ1	

A	B	C	D	E
First Order Code	First Order Category	Theme	Research Question	Construct
AI use for quality outputs/products	AI and analytics for sustainability	Technology & Knowledge Management X Green Innovation	RQ2	
Efficiency in monitoring and measuring	Automation and efficiency technology	Technology & Knowledge Management X Green Innovation	RQ2	
From efficiency to stewardship	Automation and efficiency technology	Technology & Knowledge Management X Green Innovation	RQ2	
Understanding different perspectives	Collaborative innovation and policy partnership	Technology & Knowledge Management X Green Innovation	RQ2	
Cross-partner buy in	Cross-unit knowledge exchange	Technology & Knowledge Management X Green Innovation	RQ2	
Academic contribution is good	Employee education for green innovation	Technology & Knowledge Management X Green Innovation	RQ2	
Opportunities to innovate in a green way	Employee education for green innovation	Technology & Knowledge Management X Green Innovation	RQ2	
Desire to adopt to clean technology	Green technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Pace of change and green tech adoption	Green technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Sustainability will be driven by technology	Green technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
How sustainability started	Institutional knowledge retention	Technology & Knowledge Management X Green Innovation	RQ2	
Progressive movement of sustainability	Institutional knowledge retention	Technology & Knowledge Management X Green Innovation	RQ2	
Integrating learning and innovation	Internal integration	Technology & Knowledge Management X Green Innovation	RQ2	
Data collection for demand planning	Knowledge-sharing	Technology & Knowledge Management X Green Innovation	RQ2	
Data collection in innovation is important	Knowledge-sharing	Technology & Knowledge Management X Green Innovation	RQ2	
Industry knowledge-understanding	Knowledge-sharing	Technology & Knowledge Management X Green Innovation	RQ2	
Innovation IP via adapting machinery	Open innovation and IP sharing	Technology & Knowledge Management X Green Innovation	RQ2	
Open innovation with partners x industry players	Open innovation and IP sharing	Technology & Knowledge Management X Green Innovation	RQ2	
Employee safety in manufacturing	Psychological safety for experimentation	Technology & Knowledge Management X Green Innovation	RQ2	Organisational resources
Specialised department with experts	Structural capability via specialised knowledg	Technology & Knowledge Management X Green Innovation	RQ2	
Researching impact of tech on sustainability	Tech trends and their impact	Technology & Knowledge Management X Green Innovation	RQ2	
Clean technology adoption	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Innovation in technology for sustainability	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Justifying green product technology costs	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Leveraging smart technology for green innovation	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
New systems and processes for efficiency	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Opportunity gap in alternative energy production	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Quality checks built into systems	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Retrofitting machinery for sustainability	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Starting point is current system impact/efficiency	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Technological influence on sustainability	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Technology advancement considerations	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Technology as a innovation driver	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Technology improves processes	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Technology integration into innovation	Technology innovation & adoption	Technology & Knowledge Management X Green Innovation	RQ2	
Protecting market share by staying abreast with green tech	Technology-enabled market competitiveness	Technology & Knowledge Management X Green Innovation	RQ2	
Innovation safety - biodegradable plastic	The safety of green innovations	Technology & Knowledge Management X Green Innovation	RQ2	
Business case for sustainability	Translating innovation into practical use	Technology & Knowledge Management X Green Innovation	RQ2	

APPENDIX D

- Case analysis mapping -

Appendix D: Case analysis mapping

		Cluster 1: Construction and Building Materials					Cluster 2: Consumer Goods and FMCG			Cluster 3: Retail and Pharmaceuticals					Cluster 4: PaperMaking & Recycling Service				
		P3	P4	P7	P9	P1	P1	P12	P13	P5	P5	P6	P8	P11	P10	P14	P15		
First Order Category	Code	P3	P4	P7	P9	P1	P12	P12	P13	P5	P5	P6	P8	P11	P10	P14	P15		
Accountability and ownership across levels	Accountability to global standards												x	x		x	x		
Accountability and ownership across levels	CO2 accountability reporting x beyond that			x															
Accountability and ownership across levels	Executive ownership with sustainability development										x		x						
Accountability and ownership across levels	Lack of accountability in waste disposal															x			
Balancing profit and sustainability purpose	Fit for purpose solutions		x								x								
CEO and board-level advocacy	Innovation sign-off by CEO x board level											x							
Cross-functional alignment led by leadership	Compliance led sustainability								x										
Cross-functional alignment led by leadership	Customer values alignment - sustainability wise											x							
Cross-functional alignment led by leadership	Global alignment on circular economy															x			
Cross-functional alignment led by leadership	Group company led approach vs sites													x					
Cross-functional alignment led by leadership	Procurement alignment with sustainability							x											
Departmental Sustainability Leadership	Leader enthusiasm about sustainability							x				x							
Departmental Sustainability Leadership	Leadership buy-in and motivation			x				x											
Departmental Sustainability Leadership	Leadership commitment to sustainable sourcing												x						
Departmental Sustainability Leadership	Leadership influence due to background			x															
Departmental Sustainability Leadership	Personal commitment of leadership							x											
Ethical decision-making in sustainability	No sense of urgency in making progress				x														
Ethical decision-making in sustainability	Responsible decision-making											x							
Ethical leadership and governance	Responsible supply chain practices													x					
Governance structures and oversight	Listed company - sustainability disclosure										x								
Governance structures and oversight	Structures to satisfy JSE, regulators, investors										x								
Governance structures and oversight	Sustainability department points to commitment by org															x			
Governance structures and oversight	Sustainability falling into ESG departments												x						
Governance structures and oversight committees	Corporate governance requirements			x							x								
Innovation embedded in organisational identity	Benefits of integrating various functions for sustainability															x			
Innovation embedded in organisational identity	Innovation is inherent to what we do											x							
Leadership commitment to sustainability strateg	Accountability to shareholders x customers																x		
Leadership commitment to sustainability strateg	Board level focus on sustainability												x						
Overcoming organisational resistance	Blind target setting								x								x		
Overcoming organisational resistance	Exco friction - pro vs against sustainability								x										
Overcoming organisational resistance	Executives not knowing what sustainability is			x															
Overcoming organisational resistance	Innovation vs initial resistance														x				
Oversight for transparent sustainability performa	Accountability to management regarding sustainability reporting																x		
Promoting advocacy for green initiatives	Advocating for green innovation							x											
Senior leadership driving sustainability strategy a	Executive management involvement in sustainability			x															
Sustainability integrated into strategic vision	Collaborating with common vision & understanding															x			
Sustainability integrated into strategic vision	Sustainability as part exec remuneration										x								
Sustainability integrated into strategic vision	Top down & bottom up strategic approach																x		

APPENDIX E

- Informed consent form -

Appendix E: Informed consent form

INFORMED CONSENT FOR INTERVIEWS

Research topic: *Exploring green innovation: organisational resources and product and market reconception*

Thank you for considering participation in this research study. I truly appreciate your time and input. Before we proceed with the interview, I kindly ask you to read and sign this informed consent form as it outlines the details of my study and what your participation will entail.

I'm conducting this research as part of my MPhil in Business Management specialising in Change Leadership. As part of the degree requirements, I am exploring green (sustainability) innovation, specifically how organisations are leveraging their resources and reconceiving products and markets. Our interview is expected to last between **45 minutes to 1 hour**, and your insights will play a key role in helping me understand this topic more deeply. **Your participation is voluntary, and you can withdraw at any time without penalty**.

Full confidentiality will be upheld, meaning nothing discussed during the interview will be attributed back to you in the research report.

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 software, Otter, the conversations are private and only accessible to me;
- Verbatim quotations from the interview may be used in the research report, provided they are not identified with your name or that of your organisation;
- The data to be used as part of a research 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 me or my supervisor.

This informed consent form must be signed before the interview commences. The signed form must and will be stored separately from the data collected that I am conducting research on. By signing this form, you consent to the above permissions.

My details and that of my research supervisor are provided below.

Researcher name: [redacted]
Email: [redacted]
Phone: [redacted]

Research supervisor name: [redacted]
Email: [redacted]

Signature of participant: _____

Date: _____

Signature of researcher: _____

Date: _____