



# SUSTAINABILITY REPORTING AND CIRCULAR INNOVATION; THE BEST THING SINCE SLICED BREAD?

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MASTER THESIS



## Colofon

Master thesis: Sustainability reporting and circular innovation; The best thing since sliced bread?

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## Summary

Sustainability reporting (SR) is a business activity that is not widely integrated into the current strategies of SMEs. However, the European Union aims to change this by adopting the Corporate Sustainability Directive, which mandates reporting on sustainability issues. This directive seeks to enhance the transparency and comparability of supply chains, with amongst others, key focus on the circular economy, which is not often proved in practice. In the Netherlands, bread is the most frequently wasted food product. Implementing circular innovation practices (CIP) could help reduce this waste, highlighting the need to explore what role SR is taking in the management of these innovative niches.

The objective of this study is to assess the role of sustainability reporting in management of innovative niches, in this study conceptualized as circular innovation practices. This is done among SMEs in the Dutch bread production sector. The study investigates what the place of reporting is in management of these SMEs, which current CIP are implemented in their strategies, and eventually what the role of reporting is in management of these niches. This is done through the lens of strategic niche management theory by both quantitative and qualitative research. A survey provided an overview of the sector, while in-depth interviews with multiple industry actors revealed deeper insights.

While sustainability reporting is currently a common practice in the Dutch bread production sector, the role of SR plays a minimal unconscious role. However, the evolving regulatory landscape and stakeholder pressures are likely to drive greater adoption. SR can play a significant role in defining expectations and visions by communicating strategies and fostering network building, by sharing information about circular practices, allows other stakeholders with similar values to adopt these practices. Additionally, SR enhances learning processes by making data available for comparison with others and own company, which supports both first-order and second-order learning. All of these aspects are crucial for the management of circular innovation practices. Future efforts should focus on providing the necessary resources and support to SMEs, ensuring that SR becomes a standard practice across the industry which strengthens strategic niche management.

**Keywords:** Sustainability reporting, circular innovation practices, SMEs, strategic niche management.

## Acknowledgements

Within this document, my master's thesis is presented. This is the final document to complete my master's degree in Environment & Society Studies with specialization Corporate Sustainability. After a journey of studying in different countries (Austria, Spain and the Netherlands), this is simultaneously the end-station of my student life. While I was doing my bachelor's degree in Facility management in Groningen, I made an agreement with myself that I would never get a job that would harm the environment. Therefore, a master in sustainability was a logical choice. During this master is also figured that large companies are too profit oriented that changing them is a harsh, ungrateful task. Therefore, I started to focus on small innovative companies who are intrinsically driven to change the system.

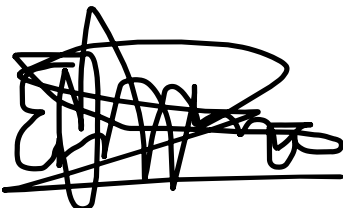
This process did not complete with many obstacles on the way, however, it is complete now; my own conducted master's thesis.

Yet, I could not do this entirely alone. Therefore, I would like to thank my company supervisor Sebastian Hetterschijt for his flexibility and contacts within the sector. I would also like to thank Sander Chan who guided me throughout the total process with clear and steering feedback.

I hope you find this research engaging and informative, particularly regarding sustainability reporting and the transition toward a circular economy. Ideally, you will be able to apply the recommendations in your own business, contributing to a more sustainable world.

Enjoy reading!

Emma Zwartjens



Nijmegen, August 2024

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## Acronyms and abbreviations

CE= circular economy

CIP = circular innovation practices

CSRD= corporate sustainability reporting directive

ESG= environment, social and government

SME= small and medium enterprise

SMEs= small and medium enterprises

SNM= strategic niche management

SR= sustainability reporting

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## 1. Introduction

Over the last half-century, there has been a growing believe that small and medium enterprises (SMEs), together with larger organizations, cannot solely focus on economic profits (Arena & Azzone, 2012). Non-financial aspects, such as the environment and social value, can benefit or disadvantage organizations. According to the European commission, SMEs are responsible for up to 64 percent of pollution in Europe (Sáez-Martínez et al., 2016). Despite this hard data, sustainability practices of these SMEs remain in its infancy (Sáez-Martínez et al., 2016).

A way to communicate these sustainability practices is by sustainability reporting (SR) (Bouten et al., 2011). Existing literature has indicated a predominant focus on SR within the realm of large corporations, revealing a notable gap in the reporting practices of SMEs. Moreover, for SMEs, the concept of SR, tends to be ambiguous and lacks well-defined tools and resources (Arena & Azzone, 2012; Colovic et al., 2019). However, a push forward is a growing public pressure for reporting. These regulatory drivers are the main pressure for SMEs to change and to couple sustainability to competitive advantage (Arena & Azzone, 2012). While large companies are already obliged to report on their non-financial performance, an expansion is imminent with the adoption of the new Corporate Sustainability Reporting Directive (CSRD) (Baumüller & Grbenic, 2021). This directive obligates both large listed companies and, at a later stage, SMEs, which are according to the directive enterprises with less than 250 employees (Directive 2022/2464), to publicly report on the well-known areas of environment, social, and governance, and aims for comprehensive reporting to enhance transparency (Baumüller & Grbenic, 2021). Besides the expanding public pressure for SR, other stakeholders such as employees, customers and investors also demand reports to enhance environmental and social performance (Morea et al., 2022).

The circular economy (CE) is one of six key elements of the CSRD and a shift will be made from suggested to measure, to a requirement to measure (Directive 2022/2464). The CE aims to eventually deviate pressure on raw materials (Kircherr et al., 2017), and the Dutch government has set a target for a 100 percent CE by the year 2050 (Ministry of infrastructure and water management, 2023). However, numerous SMEs are presently minimizing their contribution to the transition towards a CE (Baah et al., 2023). One reason for this is the absence of a framework guiding necessary measures for this type of economy, making it unclear for companies how to implement circularity in their business strategies (Opferkuch et al., 2021), intensified by the repeating oversight of SMEs in CE research (Shibin et al., 2017).

The Dutch bread production sector generates 14 million surplus bread slices daily, which equals 10% of the total bread production within the Netherlands (Timmermans, 2022). Lieshout and Knüppe (2023) add that bread and dough products constitute the predominant source of food waste within the Netherlands. However, some enterprises in the bread production sector are trying to reduce this, and fostering for change of business strategies. A noteworthy example is Bakkersgrondstof in the city of Wageningen, standing out as such enterprise. This SME establishes an innovative dual circular system in the bread supply chain by repurposing redundant bread into chicken feed and sourdough (Hetterschijt, personal communication, November 1, 2023). Bakkersgrondstof further underscores its commitment to sustainability by providing guidance to other bakeries aiming to adopt more circular innovation practices to reduce the redundant production.

According to Falkenberg et al. (2023), efforts of SR in combination with circular innovation is undiscovered, but attains more and more attention in the bread production chain (De Schutter et al., 2020). Despite, the massive amount of scientific literature on SR and CE, there remains a gap between research and practice (Caeiro, 2023).

### 1.1 Research problem statement

Even though the increasing prevalence of sustainability reporting (SR) adopted by large companies, public and stakeholder pressure, small and medium-sized enterprises (SMEs) face challenges in adopting SR and simultaneously contributing to the shift toward a circular economy (CE) through circular innovation practices (CIP). Despite the considerable academic attention given to SR and the transition to a CE, these concepts are still treated separately (Morea, 2022), and are concentrated on large companies. Consequently, there is a lack of understanding how reporting is used in the acceleration of the development of circular innovation, especially since regulatory changes like the CSRD aim to enhance the increase of CIP (Falkenberg et al., 2023). Currently, it remains unclear whether SR actually leads to more CIP within the Dutch bread production sector (Falkenberg et al., 2023), because in general, establishing a link between reporting and actual implementation is challenging, particularly for SMEs (Falkenberg et al. 2023).

### 1.2 Research aim and research questions

This study aims to investigate the role of SR on the uptake of CIP among SMEs in the Dutch bread production sector. It focusses on to what extent and how SR and CIP are implemented in the sector and what the role of SR is in the management of CIP of SMEs within the Dutch bread production sector.

Therefore, the following research question is addressed: **What is the role of sustainability reporting in the management of circular innovation practices in the Dutch bread production sector?**

To answer this question, three sub-questions have been formulated:

1. What role does sustainability reporting play in the management practices of small and medium-sized enterprises in the Dutch bread production sector?
2. To what extent are circular innovation practices adopted among SMEs in the Dutch bread production sector, using the ladder of Moerman?
3. How is sustainability reporting used for the management of circular innovation practices, among small and medium-sized enterprises within the Dutch bread production chain?

### 1.3 Scientific relevance

Understanding the scientific relevance of this study involves recognizing its contribution to the existing body of knowledge and its potential implications for future research. This research addresses critical gaps in the fields of reporting and circular innovation. By investigating the Dutch bread production sector, this work aims to advance the understanding of the use of SR in the management of CIP, to eventually create a more transparent and sustainable sector.

This research will have implications for science because it will enrich scientific knowledge of reporting and circular innovation practices, and it will put an emphasis on their connection, because now the connection between these two concepts is under investigated (Opferkuch et al., 2021). This is done by making use of the strategic niche management (SNM) theory, which enables to research how reporting is used in management by companies to accelerate circular innovation practices, which are niches, and eventually contribute to a transition towards a circular economy. This theory offers an interesting

perspective for analysing change processes (Chembessi et al., 2021). The basic idea of SNM is to replace polluting strategies with more sustainable strategies (Chembessi et al., 2021), which is also the idea of CIP. This is done by the articulation of expectations and visions, building of social networks and learning activities (Hoogma et al., 2005).

Moreover, the scientific relevance of the research lies in its contribution to understand and address the complexities surrounding SR and CIP, particularly for SMEs, because they have been overlooked in previous studies (Shibin et al., 2017) and there remains a gap between reporting and implementation of sustainable practices in general (Falkenberg et al., 2023). By these contributions, the gap between theory and practices is bridged.

#### 1.4 Societal relevance

This study holds societal relevance due to its implications for both sharing knowledge for society and information about environmental sustainability. As global pressures to address environmental issues and adopt sustainable practices increase, the role of businesses, particularly SMEs, becomes increasingly critical. SR and CIP are essential components in this transition, aiming to promote environmental responsibility (Opferkuch, et al., 2021).

However, SMEs encounter numerous challenges in integrating SR and CIP into their business processes, which hinders progress toward these goals. This not only impacts the environmental footprint of SMEs but also their competitiveness in an increasingly sustainability-driven market (Falkenberg et al., 2023).

By investigating the role of reporting in the development of CIP, stakeholders may simultaneously advance sustainable business strategies, thereby contributing to a more sustainable Dutch bread production chain and reducing the environmental impact of enterprises, because food waste has direct impact on the economy, environment and society (Papargyropoulou et al., 2014). Because of poor food management and funding, the problem of food waste is expected to last until 2050 (Manzoor et al., 2024). By addressing this problem from both a reporting as circular economy view, it will be suppressed.

The implications of this research extend to policymakers, who can strengthen SR initiatives by acknowledging the role it can take in management and challenges faced by SMEs. By addressing these obstacles, policymakers can provide the necessary support to facilitate the implementation of SR. This integrated approach has the potential to incentivize companies to adopt both SR and CIP simultaneously, thereby enhancing accountability across multiple stakeholder groups. Consequently, this shift toward sustainability is likely to cultivate a greater number of environmentally responsible SMEs within the industry.

A side effect is the elaborative power of this research, because it is examining the status quo of both SR and CIP. This is particularly relevant as it is providing insights that can motivate actors within the Dutch bread production sector to learn from established practices (Geels & Schot, 2008). By exploring formal and informal reporting mechanisms and understanding the motivations behind other companies' engagement in reporting, this study aims to foster greater adoption of SR, thereby promoting transparency and information sharing within the sector and among society (Opferkuch et al., 2021).

On the same note, companies within the sector are becoming increasingly known with CIP initiatives undertaken by their competitors. Through the imitation and assimilation of innovative practices, companies can actively work toward reducing food waste. Highlighting the growing public pressure for

sustainability reporting, this study encourages stakeholders to reassess their business strategies and recognize the necessity for change.

### 1.5 Thesis outline

To address the research question, this study begins with an overview of the background of the investigated sector. Following this, an extensive literature review is presented, delving deeply into the concepts and theory utilized in this research and their interrelations. The methodology chapter subsequently details the procedures and approaches employed to conduct the research. The results chapter then presents the findings derived from the data analysis.

Next, the conclusions and recommendations chapter provide answers to the sub-questions and the main research question. The recommendations are specifically tailored for the sector, policy makers and standalone SMEs, offering practical suggestions for improvement. Finally, the discussion and limitations chapter outlines the research contributions and addresses the constraints and challenges encountered during the study.

## 2. Background

Before the literature chapter is written, background information about the sector researched is given, to create a broader understanding of how the Dutch bread production chain is constructed.

### 2.1 The bread production sector

Within the Netherlands, grain cultivation amounts to approximately 1.7 million tonnes, representing less than 1% of the total grain production in the European Union. The Dutch grain market is known for its high volatility and relatively small share of total European production (Berkhout et al., 2023). Wheat is the primary grain cultivated, with a total production of around 1.3 million tonnes, of which approximately 0.5 million tonnes are processed into animal feed. To meet the total wheat demand of 14 million tonnes within the Netherlands, the country heavily relies on imports, primarily from France and Germany. As of 2022, the total arable land in the Netherlands was 536.000 hectares, with wheat occupying 23.2% of this area (CBS, 2023).

A significant portion of Dutch wheat is unsuitable for baking purposes due to its low protein content (Van Eekeres, 2022). After cultivation, wheat is collected by various collectors who store and trade it before delivering it to mills for processing into flour and other baking ingredients. Dossche Mills, one of the largest mills in Europe, processes 1.2 million tonnes of wheat annually, covering 45% of the Dutch market and operating outside the SME category. Additionally, there are two medium-sized mills and several smaller ones in the Netherlands, together importing 80% of their wheat from Germany and France (Berkhout et al., 2023).

The processed wheat is then supplied to organizations that enhance it with additional ingredients such as sugar, eggs, and oil to prepare it for baking (Berkhout et al., 2023). These raw materials are subsequently distributed to bakeries, which are categorized into two main types in the Netherlands: industrial bakeries and artisan bakeries. Industrial bakeries, making up 80% of the market, primarily supply supermarkets. Large industrial bakeries produce 60% of the total bread output, with the remainder being produced by SMEs. Artisan bakeries primarily produce for direct consumers. In 2022, there were approximately 1,400 artisan bakeries, all classified as SMEs (Van Eekeres, 2022). These industrial and artisan bakeries fall under different industry associations. The NBC (Dutch bakery center) is an overarching foundation for all types of bakeries. The NVB (Dutch association bakery), is the association for the industrial bakeries and the NBOV (Dutch bread and banquet enterprise association) is the association for artisan bakeries.

Topbakkers B.V. plays a pivotal role by connecting and supporting a network of 65 artisan bakeries, helping them increase sales and providing financial and administrative support. Some artisan bakeries also distribute their products through wholesalers, who then sell to the catering industry or directly to consumers. In contrast, industrial bakeries supply bread directly to supermarkets, restaurants, and hotels, similar to the distribution model of artisan bakeries (Berkhout et al., 2023).

In summary, the Dutch bread production sector is displayed in figure 1. This model shows the general supply chain. Exceptions are not included.

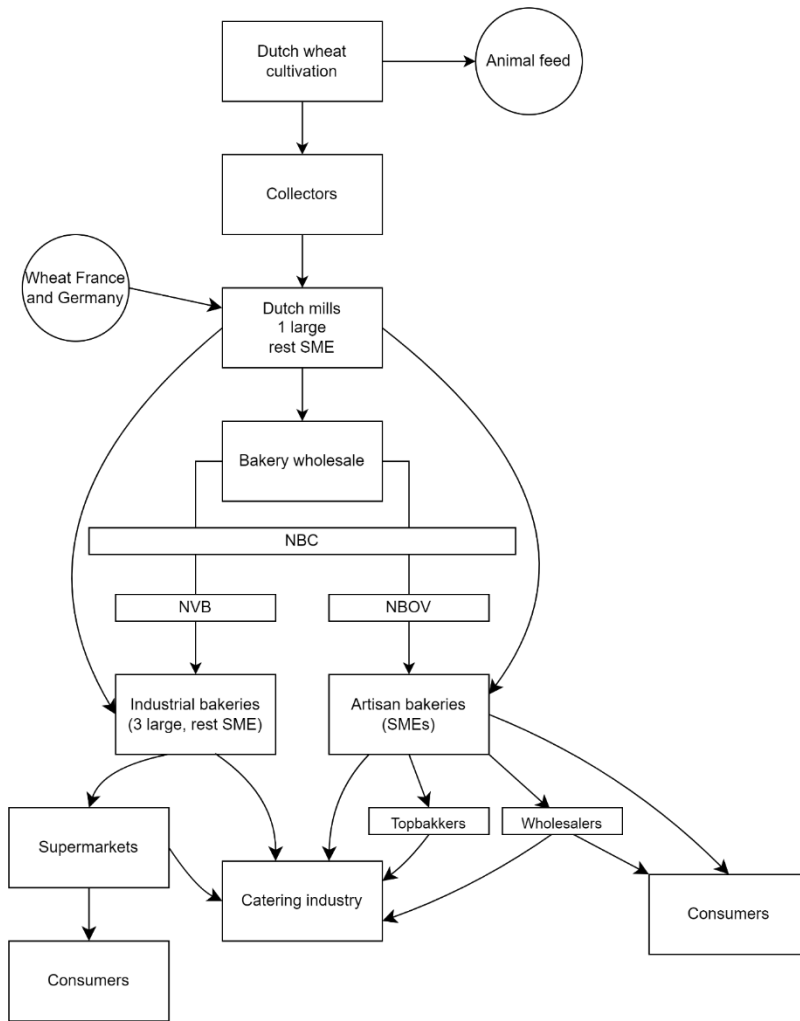


Figure 1: Bread production sector (Berkhout et al., 2023)

### 3. Literature review

This section describes the main concepts and theories which will function as the building blocks of this research. First the two central concepts circular innovation practices and sustainability reporting are described, and secondly the utilized theory is explained. The connections between the concepts, theory and SMEs are interwoven in this chapter.

#### 3.1 Circular innovation practices

To understand how CIP has originated, the circular economy (CE) is firstly explained, because the term ‘circular’ in circular innovation practices comes from the concept of a circular economy (CE) (Stavropoulos et al., 2021). CE is a concept which holds many different definitions and therefore, it can be seen as a contested concept (Korhonen et al., 2018). However, scholars have been looking at this concept increasingly over the last decade. One, among many, common used definitions of CE is “An economic system that replaces the ‘end-of-life’ concept with reducing, alternatively reusing, recycling and recovering materials in production, distributions and consumption processes. It operates at the micro level, meso level and macro level, with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity to benefit of current and future generations. It is enabled by novel business models and responsible consumers” (Kircherr et al., 2017, p. 229). The importance for the CE is caused by the increasing global population, and simultaneously growing living standards and consumption patterns (Homrich et al., 2018). Therefore, a regenerative design is necessary to perceive the highest value of materials possible (Ellen MacArthur Foundation, 2014), whereby waste will be reduced. The end-goal of the CE is to develop a system in which resources will have a longer life and will be used optimal.

The term ‘circularity’ in CE has derived from the concept ‘feedback loop’ (Rockström et al., 2009). Within a feedback loop, two or more variables are effecting each other. While looking at supply chains, multiple actors are included and influence planning and control of materials (Golroudbary & Zahraee, 2015). Therefore, creating feedback loops and interrelations is challenging. Companies should design a self-renewing economy that limits matter, energy flow and ecological strain without limiting economic, social and technological development (Andersen, 2007, as cited in Barnabè & Nazir, 2020, p. 2004). Production processes need to be renewed, business models should be changed, and waste should always be treated as a new flow of materials (Barnabè & Nazir, 2020). Within this study, the CE is therefore seen as an system where products are applicated into closed loops, which maintains the value of the products (Ellen MacArthur Foundation, 2014), thereby, waste is eliminated. The ultimate end goal of the CE is a longer life of resources which are optimal used (Ellen MacArthur Foundation, 2014).

Various studies have shown that corporations are increasingly engaging in CE for multiple reasons by innovating with circular practices (Barnabè & Nazir, 2020). The CE will offer benefits for organisations, both short-term and long-term but also has its limitations, such as spatial and temporal boundaries (Korhonen et al., 2018). It is multidimensional and cannot be limited to one organisation, material or dimension of society. CE is often associated with sustainable development and embraced globally (Nouri et al, 2019).

## Circular economy and food production

Food waste is a currently a global problem (Kumar et al., 2023). Within Europe, and especially within the Netherlands, bread is a staple food, which means that it has a prominent place in daily diets (Kumar et al., 2023). Due to overproduction and the short shelf-life, bread is a major part of national food waste. The large amounts of bread waste not only is a loss of product, it simultaneously costs water, energy, transportation and manufacturing emissions which leads to global warming, acidification and eutrophication (Brancolet al. 2020). Furthermore, bread waste can also lead to loss of revenue (Kumar et al., 2023). Therefore, to treat bread waste in a circular manner, reduction and recycling of bread, can advantageous for the economy and prevent greenhouse gas emissions to be emitted (Kumar et al., 2023). The sources of food waste can be divided in two branches; loss before the consumer, and loss at the consumer (Lehmann et al., 2022), this research only focusses on bread that is lost before the consumer, because here, SMEs are involved.

Companies who try to counter the bread loss, are involved with circular innovation practices (CIP). These practices come in many different forms. Within the food sector, several practices are implemented for reduction of food waste, safety, production, traceability, quality and environmental degradation (Zhang et al., 2022). The reduction of food waste is the most critical sustainability issue (Zhang et al., 2022), and much CIP must be related to this in order to meet the concept of CE. However, according to Sadaleer et al., (2020), food waste prevention practices have received far less attention than waste treatment and recovery practices. Along with Zhang et al., (2022) they also point out that prevention practices have greater environmental and economic benefits than food recycling strategies. Therefore, companies must put more emphasis on preventing food waste, rather than reusing the waste that is already been made (Zhang et al., 2022; Papargyropoulou et al., 2014).

A way to operationalize CIP in the food-production sector is by making use of the ladder of Moerman, which also prioritizes prevention of waste (Lehmann et al., 2022). This ladder is a deviation of the more commonly known ladder of Lansink which is since 1979 used for waste policy within the Netherlands, and related to the circular economy (Van Berkel & Schoenaker, 2020). The ladder of Moerman is more focused on food waste (Timmermans, 2022), instead of general waste (Van Berkel & Schoenaker, 2020). This model indicates how much value can be attained from food that is lost. This ladder is used in this study to investigate whether the sector is aware of the level of circularity for their current circular innovation practices, which types of circular innovation practices are adopted within the sector, and for which types of practices the sector is aiming for. For this figure (figure 2), the higher up the ladder, the more circular the practice is (Lehmann et al., 2022). Lehmann et al. (2022) state that the six lowest levels (raw materials for industry and below) are per definition degrading the value of the food. Therefore, within this research, only prevention, use for human food, conversion to human food and use in animal feed are defined as CIP.

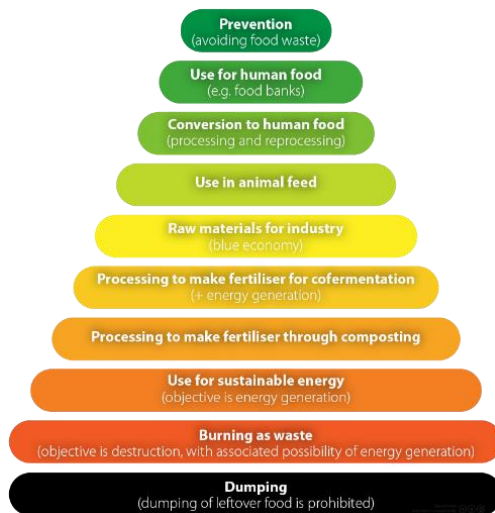


Figure 2: Moerman's Ladder (Sonac, 2020)

### 3.2 Sustainability reporting (SR)

Since the late 1990s, sustainability reporting (SR) became a relevant topic in businesses and amongst scholars (Hahn & Kühnen, 2013). Sustainability reports often consist of objective information for stakeholders to make evaluations of an organisations non-financial performance including social and environmental information. Disclosing these types of information helps investors and other stakeholders to put performance in context (Opferkuch et al., 2021). Reporting may have different benefits for companies including increased credibility, reduced legal risk, improved supplier relationships and increased access to capital (Opferkuch et al., 2021), because it often increases transparency, reputation, brand value and competitiveness (Hahn & Kühnen, 2013). Besides, these authors write that SR is widely recognized as important factor influencing sustainability. (Hahn & Kühnen, 2013; Wu et al., 2013).

Sustainability reports, also labelled as 'corporate social responsibility' (CSR) or 'triple bottom line reports: people, planet, profit' (TBL) or 'environmental, social and governance' (ESG) disclosures, have originally focused on environmental information, broadening their scope to include ethical and social issues, usually employee and community matters, as well as corporate governance aspects (Kolk, 2008).

Research into corporate sustainability has shown that to deal with sustainability challenges, organizations must posit a set of capabilities that go beyond mere regulatory compliance (Wu et al., 2013). Moreover, several studies prove that reporting influences the development of a company's corporate strategy (Wu et al., 2013).

However, reporting is not always directly leading to sustainable development. Hopwood et al. (2005) claim that companies are often reporting on aims and intentions rather than actual performance. To decrease this shortcoming, frameworks, initiatives and approaches have been developed to help companies to report in a comparable, consistent and reliable manner, including legal regulations (Opferkuch et al., 2021). Such frameworks are developed by different types of institutions such as the government, investors, NGO's and academics. Companies may use multiple reporting approaches to publish. The downside of this is that results are lacking comparability between reports (Dragu & Tiron-Tudor, 2013). Yet, with the coming of the CSRD, this will change (Opferkuch et al., 2021).

There are several channels through which companies report and distribute sustainability information, (Carmo & Miguéis, 2022). The formal channels are for example annual reports, integrated reports and

standalone reports, and informal channels are webpages, LinkedIn, or newsletters (Carmo & Miguéis, 2022). For sake of simplicity and viability throughout this research, SR is the release of sustainability related information by companies by any (formal and informal) channel, similar to the research of Carmo & Miguéis (2022). The definition of SR in this research is therefore: “sustainability reporting and sustainability disclosure are used as synonymous for the release of sustainability information by companies through any channel” (Carmo & Miguéis, 2022, p.3).

This research deals with the adoption, extent and quality of this information. The adoption refers to the decision or likelihood to communicate sustainability related information through any channel, the ‘extent’ refers to the quantity of information distributed through the channels and ‘quality’ deals with the characteristics of the information such as specificity, verifiability and monetary data (Hahn & Kühnen, 2013).

### 3.2.1. Sustainability reporting and small- medium enterprises

For large companies, SR is conceptualized as the basis for a firms’ strategy (KPMG, 2017), however for SMEs this has not yet come to pass because smaller enterprises are newcomers in the field of SR; nevertheless, there is ongoing improvement in this regard (Gutiérrez et al., 2021). But still, SMEs have a long way to go regarding reporting because they are not extensively involved or experienced (Agostini, Costa & Bagnoli, 2018), also because a regulatory requirement to do so is absent. Additionally, SMEs have been overlooked in SR literature because large enterprises have more power and influence to local governments and a greater impact on society (Colovic et al., 2019) Yet, SMEs play a large role in the European economy (Domenech & Bahn-Walkowiak, 2019). Arena and Azzone (2012), state that SR becomes more evident for SMEs because of the challenges they face, and the demands of their stakeholders and regulatory public pressures that will come in the near future (Opferkuch et al., 2021).

Generally, producing a sustainability report entails a decision-making process characterized by rules and ad-hoc procedures, but SMEs lack practical and effective instruments and resources to do so (Arena & Azzone, 2012). However, there are different standard frameworks accessible to help SMEs (Gutiérrez et al., 2021). The dominant used frameworks are the United National Global Compact (UNGC), International standards organisation (ISO) 26000 and the Global Reporting Initiative (GRI) (Siew, 2015). Additionally, there are tools that are more applicable regionally, sectoral or interdisciplinary (Olanipekun et al., 2021). The standard reporting frameworks are mainly focussed on all three dimensions (economic, social and environment) of CSR, while others may be focussing on one aspect alone (Olanipekun et al., 2021). These different frameworks can be confusing for SMEs, because of organizational characteristics (Gutiérrez et al., 2021), and be difficult to compare (Olanipekun et al., 2021). Moreover, literature about reasoning behind and enterprise selection of a framework is little present and there is no literature that provides an approach for SMEs in their decision-making process related to sustainability reporting. Therefore, SMEs often disclose non-financial information in a self-made template which is not aligned with a specific reporting framework (Gutiérrez et al., 2021).

To improve the comparability of the reports, the EU enacted the CSRD, which expands the number of European companies to prepare a sustainability report (Pozzoli et al., 2023). The directive replaces the term ‘non-financial information’ with ‘sustainability information’, which makes it also applicable for financial information (Pozzoli et al., 2023). Among many other requirements, the CSRD demands reporting on circular innovation practices, and this is increased because the CE is also a growing topic on the European Union agenda (Pozzoli et al., 2023).

### 3.3 Combination of the two concepts

Research interest in the integration of CIP is growing, however, the role of reporting in CIP is little present (Opferkuch et al., 2021). Additionally, the potential of comparing sustainability contributions of these practices is under investigated (Opferkuch et al., 2021). Currently, the CE is promoted as one of the key strategies within the Green Deal, suggesting that CE will improve the European economy (Domenech & Bahn-Walkowiak, 2019), and include measures to adopt CIP. A comprehensive and integrated approach for managing and communication information about CE information would not only be to communicate about the resources that are used, the circular innovation practices and the results achieved (Ellen MacArthur Foundation, 2014), but also the interconnections and the feedback loops that are active across different organisations and disciplines (Barnabé & Nazir, 2020).

As mentioned before, only a little amount of authors have discussed existing reporting approaches with CIP coverage (Opferkuch et al., 2021). The academics that did, all concluded that the existing frameworks did not comprise CIP in total. Some miss guidelines for audits, others only cover results and lack in providing specific tools that can be used to report. Furthermore, the challenges associated with reporting on CE have scarcely been explored. Esken et al. (2018) state that it is a collaborative process and comparable reports are necessary to see which companies can work together within and across supply chains to establish more CIP.

However, according to Barnabé and Nazir (2021), SR and CIP share several commonalities. Firstly, both CIP and reporting are built on the concept of 'capitals'. In reporting terminology, 'capital' refers to any asset that an organization can utilize in the creation of goods or services. In both SR and CIP, capitals are regarded as interwoven inputs essential to all operations, with the goal of creating value over time (Barnabé & Nazir, 2021). Secondly, both SR and CIP focus on how this value is created. This means that both CIP and SR see value creation as an ongoing process that needs to be tracked and reported regularly, considering short-term, medium-term, and long-term results (Barnabé & Nazir, 2021). Thirdly, both SR and CIP consider value creation to be an integrated closed-loop system, where outcomes provide feedback on inputs (Barnabé & Nazir, 2021). Fourthly, both approaches regard the business model as a foundational element. They emphasize that processes should be integrated within these models rather than being added on top or alongside them. Fifthly, both SR and CIP adopt a holistic perspective, taking into account all interrelationships, both internal and external. Lastly, both approaches share the common goal of achieving the highest possible value creation (Barnabé & Nazir, 2021).

Furthermore, the CSRD requires sustainability standards to be prepared in accordance with European sustainability reporting standards. As a result the EU adopted the first set of these standards with five general environmental standards (Directive 2022/2426). Standard 5 is called "Resource Use and Circular Economy". The EU adopted one definition of this as an economic system in which the value of products, materials and other resources in the economy is maintained for as long as possible, enhancing their efficient use in production and consumption, thereby reducing the environmental impact of their use, minimizing waste and the release of hazardous substances at all stages of their life cycle, including through the application of the waste hierarchy. The goal is to maximize and maintain the value of the technical and biological resources, products, and materials by creating a system that allows for durability, optimal use or reuse, refurbishment, remanufacturing, recycling, and nutrient cycling (Directive 2022/2426). The EU aims that this definition improves the uptake of sustainable practices and thus circular innovation practices.

As can be read, the two concepts are closely linked to each other, however, it is not clear if and how reporting is used for the uptake of circular innovation practices, especially in the Dutch bread

production sector (De Schutter et al., 2020). Therefore, the role of reporting in the management of niches, which circular innovation practices are, is researched through the lens of strategic niche management.

### 3.4 Strategic niche management theory (SNM)

There are many different theories which are used to assess sustainability transitions and the management thereof. Examples are the multi-level perspective theory (MLP) (Geels, 2002), technological innovation systems (TIS) approach (Hekkert, et al., 2007) and the strategic niche management (SNM) approach (Smith & Raven, 2012; Hoogma et al., 2005). In this research SNM is chosen, because the role of reporting in management is studied and how this impacts circular innovation practices, rather than the actual transition to a circular economy or reporting landscape is (Susur et al., 2019), for which the MLP and TIS are more suitable.

SNM is the process of managing niche formation processes through innovative experiments (Hoogma et al., 2005). The theory enables three different niche-building processes for the development of innovations; the articulation of expectations and visions, network building and learning (Schot & Geels, 2008). These three components are complementary and provide an understanding of how innovations drive and emerge within the socio-technological transitions (Geels, 2002). The articulation of expectations and visions is crucial for niche development because it provides a direction for learning and exploring (Schot & Geels, 2008). These expectations and visions should be shared by many actors. The building of social networks creates a basis for new technologies, supports interactions between stakeholders and provides the necessary resources, such as people, money and expertise (Schot & Geels, 2008). These networks aim to be a broad scala of stakeholders with different interests. Regular communication is necessary to align this group of people to foster the uptake of the niches (Schot & Geels, 2008). Learning relates to what market preferences are, what the infrastructure of the niches need to become, and the societal and environmental effects of the niches (Schot & Geels, 2008). This may include facts and data (first-order learning), and differences in frames and/or assumptions (second-order learning). According to Geels (2002), if visions become more precise and accepted by a broad network of people, and if learning processes lead to a stable configuration of the niche, changes in established patterns may appear.

SNM enables innovation to connect with the social context (Hoogma et al., 2005). Therefore, more new and potential sustainable patterns emerge, and new practices based on experiences and ideas appear. The theory is based on the assumption that the needs and wants of users are not fixed, and can change if new innovation arises (Hoogma et al., 2005). The needs and wants are mostly based on previous experiences, and new experiences may convert these needs and wants (Hoogma et al., 2005).

The theory can be used as a model or tool (Smith & Raven, 2012). When using it as a model, technological innovation is better understood because it sheds light on the conditions for successful emergence, pathways of change and protection of innovations. SNM as a policy tool is mostly used in transition where it is defined as the establishment, growth and gradual elimination of protected spaces for the development and implementation of innovative technologies through experimentation (Kemp et al., 1998). This type of SNM is also utilized by Bakkersgrondstof B.V. For this research it is used as a model to understand how niches (CIP) appear through one specific aspect of management (reporting).

The niches that are managed by this theory can also be divided in two types. At first socio-technical niches emerge, these are the new innovative technologies (Susur & Engwall, 2023). When they have more advantages than the current established systems or products, they may become market niches (Susur & Engwall, 2023). These niches can be empowered in two ways; either they prove to bring not

too much change to the current system, so they can be embedded in the regime easily, or, they prove to change the rules of the game and reform institutions and set new norms for example for sustainability which is more advantageous and desired than the current systems (Susur & Engwall, 2023). Critique on this approach is that there is a predominant focus on new techniques and the social aspect of innovation is often neglected (Susur & Engwall, 2023).

### **The niche**

In this study there is drawn upon SNM, conceptualizing circular innovation practices as niches. Niches are defined as initiatives that represent a highly innovative socio-technical configuration with the potential to achieve significant sustainability improvements, and are based on experiments (Smith & Raven, 2012). As can be read before, the aim of corporate circular innovation practices is to accelerate sustainable businesses which is in line with the definition of niches in the strategic niche management theory.

Circular innovation practices fall under the regime dimension “technologies and infrastructures” (Smith & Raven, 2012, p. 1028). According to them, current technological standards can disadvantage path-breaking innovations, because those often require different standards, infrastructures and are at first glance, economically more effective. So, it is difficult for the experiments to become regular (Smith & Raven, 2012).

Those experiments, can be recognized by their ad hoc nature and capacity to involve actors which normally not work together or cooperate. The experiments are usually implemented outside institutional frameworks and aim to establish change in a well-established system (Chembessi et al., 2021). Those experiments rely heavily on mutual understanding between stakeholders, as well as shared resources, skills, institutional arrangements, and common values and beliefs (Hoogma et al., 2005), and therefore, stakeholders are of major importance for niches to be adopted. The commitment of these stakeholders is necessary and need to be managed for successful uptake of niches (Hoogma et al., 2005; Caniëls & Romijn, 2008). Freeman (1990) is adding that stakeholders are central drivers for enterprises to adopt sustainability practices. According this same author, stakeholders are not only people how are directly involved with an enterprise, but can also be actors with less direct connections. The way stakeholders are treated leads in how managers are operating and is closely linked to processes of the business and the value these processes create (Theodoulidis et al., 2017).

### **Management of the niche**

Current studies have shown that sustainability reporting facilitate the implementation of sustainability strategies (Pérez-López et al., 2015), and is often adopted as an strategic management tool (Pérez-López et al., 2015). Therefore, it is important to assess the external and internal motivations for businesses to adopt SR (Pérez-López et al., 2015). These internal and external motivations are reliant on stakeholders (Kolk, 2008). According to Cheng et al. (2013), an integrative report, similar to SR “will be of benefit to all stakeholders interested in an organisation’s ability to create value over time” (p. 97). Conway (2019) go beyond this definition and even state that the rationale of reporting is underpinned by stakeholders. Vitolla et al. (2019), indicate that the quality of the reports depends on stakeholders’ pressure, because according to them, the higher the quality of reporting is, the more active communication from company to stakeholder.

The greatest similarity between reporting and managing stakeholders is that they both put an emphasis on the incorporation of societal interest in business operations (Freeman & Dmytriiev, 2017). Therefore, there can be stated that sustainability reporting is a strategy to manage stakeholders. As

stated before, stakeholders are of high importance for niches to develop and therefore, the focus for this study on the role of reporting existed.

A part of niche management is the distinction between in-side out innovation, which makes internal knowledge accessible to others and outside-in innovation which integrates knowledge of external resources into an enterprises innovation activities (Eisenreich et al., 2021). This research concerns the involvement of stakeholders in developing circular innovation practices, and stakeholders implementing circular innovation practices (Greer et al., 2020; Caniëls & Romijn, 2008). Therefore, it focuses both on outside-in and inside-out innovation.

Therefore, it is of importance to research which stakeholders need to be managed by sustainability reporting. In this study, such as done in other literature, stakeholders can be categorized into primary and secondary stakeholders (Marcon et al., 2023). The primary stakeholders influence the enterprise directly and are for example employees and shareholders (Macron et al., 2023). The secondary stakeholders are mostly external and these do not have an effect on the enterprises value creation, and are unnecessary for the enterprises survival but can have an impact on the reputation, both positively as negatively (Marcon et al., 2023). Examples of this kind of stakeholders are the media and environmentalists. There always has been a strong emphasis on the primary stakeholders because of the resources and capacity, however secondary stakeholders have increasing influence by the evolving attention for sustainable development and the coming of the CSRD. Perrini et al. (2004), have developed a comprehensive reporting framework for SMEs, in which they address the following stakeholders: employees, shareholders, customers, suppliers, investors and government. According to them, these are the key stakeholders for SMEs to report for. Therefore, these stakeholders will also be addressed in this research. In addition, Jacobs (1997) argues that the environment should also be treated as stakeholder. According to him the focus of the stakeholder theory is often too much on people. Despite this stakeholder does not have a voice, and could not be participating in a network, it could be in the interest of this group to base decision-making structures on (Jacobs, 1997), and if the environment is treated as a stakeholder, it becomes a company’s responsibility. Therefore this stakeholder is added. Freeman and Dmytriiev (2017), label the first five groups as primary stakeholders and the last ones as a secondary stakeholders. These authors add that competitors are also key stakeholders for SMEs because often there are similar businesses around. Therefore, the secondary stakeholder competitors will also be addressed. Table 1 shows the stakeholders within their groups.

Table 1: Stakeholders SME

Stakeholders	
Primary	Secondary
Clients	Government
Employees	Competitors
Shareholders	The environment
Suppliers	
Investors	

The focus on stakeholders, while using the SNM theory, facilitates the identification of the stakeholders to whom significant attention is directed, thereby clarifying which stakeholders are most powerful in

SR and CIP decisions. This analytical framework serves as a guide for directing attention to specific areas requiring strategic focus (Marcon et al., 2023).

### 3.5 Conceptual framework

The conceptual framework is drawn to create a simple understanding of the concepts linked to this research (figure 3).



*Figure 3: Conceptual model*

As can be seen in the figure, the role of SR in management of CIP is measured through the lens of the strategic management theory.

## 4. Methodology

This section outlines the used methodology for conducting this research. It starts off with the research philosophy, followed by the strategy, methods, data collection and data analysis.

### 4.1 Research philosophy and strategy

In scientific discourse, research philosophy serves as a foundational framework for both the natural and social sciences, offering overarching principles for theoretical reflection. Key branches of research philosophy include ontology, which delves into the nature of existence, and epistemology, the examination of knowledge creation (Moon & Blackman, 2014). According to these authors, there are multiple perspectives which can be applied to research; positivism, post-positivism, structuralism, constructivism, post-structuralism, post-modernism critical theory, interpretivism and pragmatism.

The constructionist view state that there are multiple ‘truths’ constructed by the individual mind or in social context. Interpretations together create an understanding of a phenomenon (Denzin & Lincoln, 2011). This philosophy is based on subjectivity (Moon & Blackman, 2014). This study more focusses on potential objectivity by creating generalizable results for which the constructionist theory is less applicable (Moon & Blackman, 2014). The philosophy interpretivism is based on in-depth meanings with the perspective that humans cannot be similarly assessed as physical objects. Cultures, circumstances and time is leading in different social realities. A critique of this philosophy is that participants would not provide general interpretations (Saunders et al., 2012). This study requires a general understanding about the bread sector, therefore, this perspective is not applicable. Structuralism is focused on underlying structures that shape behaviour, and is mostly used to descent complex social phenomena which shapes human behaviour (Moon & Blackman, 2014). In this study complex social phenomena in relation with human behaviour is not discussed, so this perspective is less relevant. Critical theory tends to be more about changing society than understand it (Moon & Blackman, 2014). This research is more focussed on the status quo of phenomena and the influence thereof, and not so much about changing certain social construction or emancipation (Moon & Blackman, 2014). The perspectives post-structuralism and post-modernism are more deconstruct based (Moon & Blackman, 2014). When a perspective is deconstructing, it means that it seeks to break down and analyse underlying assumptions to shape an understanding of a subject (Moon & Blackman, 2014). This study does not seek to deconstruct social norms, so these two perspectives are not applicable (Moon & Blackman, 2014). Positivism is mainly based on observations and is often used in natural sciences (Moon & Blackman, 2014). This method results in generalizable outcomes, which is beneficial for this study, however, this perspective claims that absolute objectivity is attainable (Moon & Blackman, 2014). This claim is altered by post-positivism which is a more critical and flexible approach, claiming that absolute objectivity could never be reached (Moon & Blackman, 2014).

Therefore, post-positivism is the research philosophy adopted for this study. This philosophy recognizes the limitations of objectivity because researchers should acknowledge biases and subjective perspectives (Moon & Blackman, 2014). Context and interpretation should be taken into account while understanding different phenomena, because social realities are complex and cannot fully be captured by objective measures (Moon & Blackman, 2014). This study tries to understand the connection between two different phenomena in a specific sector, however the subjectivity of the researcher and research participants will bias the findings and conclusions. So, the results can never be understood as totally true (Moon & Blackman, 2014). The bias is large within this research because it relies on self-

reported data. The researcher is known with the fact that participants would rather not react on certain aspects of this research because it could potentially harm their business. A limitation of this perspective is that making firm conclusions is difficult (Denzin & Lincoln, 2011). Therefore, a mixed method approach, which combines two or more types of methodology (Creswell, 1999), is recommended because multiple methods can cross-check and validate findings (Denzin, Lincoln, 2011). This enhances the reliability and comprehensiveness of the research (Cresswell, 1999), especially in holistic research fields, such as sustainability science (Biggs et al., 2021). Creswell (1999) states that since mixing qualitative and quantitative methods incorporates multiple ways of making sense of the world, it creates a better way of understanding complex problems.

The research further holds an inductive approach because conclusions will be drawn from data (Bryman, 2016). Literature research functions as the fundament and guiding factors of this research and will be the basis of the survey and interview scheme. Literature is also necessary to combine the practical aspects of this study with academic theories (Kehoe et al., 2022). This will be an iterative process (Bryman, 2016).

Combining inductive, iterative research with a post-positivist view enables the researcher to build theories which are grounded in empirical observations, and recognizes that these theories are provisional and subject to refinement (Creswell, 1999).

#### 4.2 Research methods, data collection and analysis

The research uses a multiple case study approach, because it enables the research to analyse data within and across situations, and the similarities and differences of these situations will appear (Yin, 2002), which makes the research strong and reliable (Baxter & Jack, 2015).

Two different methods are applied within this approach according to the mixed-method strategy. First, a survey was distributed to generate general results. This method is chosen because it allows the acquisition of large quantities of data, which is useful for analysing status quo (Calder, 1982), which gave superficial, generalizable answers the sub-questions. In the second phase, in-depth information about the two phenomena was gathered by interviews. This made it possible to delve deeper into the questions asked within the survey.

##### **Sample strategy**

The survey strategy holds a probabilistic approach which is mostly used in quantitative research (Palys & Atchison, 2014). Despite the fact that this survey was not a total quantitative survey, it is useful that the results are more generalizable compared to a non-probabilistic approach which was used at the second phase of this research while doing interviews (Palys & Atchison, 2014). The survey entailed closed-ended and open-end questions. The closed-ended questions are asked to obtain information about the characteristics of the respondents. The open-end questions aimed to acquire deeper information about the topic. The four main probability sampling methods are simple random sampling, systematic sampling, stratified sampling and cluster sampling (Palys & Atchison, 2014).

Simple random sampling and systemic sampling are not useful for this study because the aim is to require answers for the total sector, which holds groups with heterogenous characteristics. By applying one of these two methods, the chance exist that not every group is represented (Palys & Atchison, 2014). While using cluster sampling, the researcher clusters units of analysis in heterogenous groups which represent the total population. This method poses a challenge as ensuring equal groups is often

uncertain, and it requires significant effort to establish such groups (Palys & Atchison, 2014). Therefore, this method is not used in this research. The stratified sample technique, enables the researcher to divide units of the population into homogenous groups (strata) according to characteristics (Palys & Atchison, 2014). Then, the units in this group were chosen by using one of the former techniques described above. The combination of stratified sampling and simple random sampling was beneficial for this research, as it is essential to divide the population based on specific characteristics. Incorporating simple random sampling is more straightforward and less time-consuming compared to systematic sampling, and therefore chosen as addition to the stratified sampling technique. Furthermore, this technique enhances the likelihood of a higher response rate (Palys & Atchison, 2014). This strategy is also named multi-staged sampling with stratified sampling as the first stage and simple random sampling as the second stage (Sedgwick, 2015).

A drawback associated with stratified sampling is that certain strata’s might comprise a significant percentage of the total population. Consequently, some strata may be overrepresented or underrepresented (Palys & Atchison, 2014). To address this issue, weights are assigned to the strata, with larger strata receiving a higher number of samples in the study. A 5% sampling factor, chosen with the heuristic approach (Rosén, 1997), requires a sample size of 75. The strata, weights and minimal sample units can be found in table 2\*.

Table 2: Sample size

Strata	Units in population	Weight	Aimed sample units	Actual sample units
Dutch mills	10	1%	1	1
Industrial bakeries	40 (NVB, 2024).	3%	2	4
Artisan bakeries	1400	96%	72	42
Other	-	-	-	5
<b>Total</b>	<b>1450</b>	<b>100%</b>	<b>75</b>	<b>52</b>

\*The units in population are gross estimations.

Eventually a 5% sampling factor was not reached. Instead of the 75 aimed respondents, 52 respondents have filled out the survey. Which results in a 3,6% sampling factor. The actual sample units are displayed in table 2. The ‘other’ group was added because some respondents which were not SME filled out the survey and companies related to the sector but not actually in the sector have filled out the survey as well. Their results were not useful for the research.

The distribution of surveys to the population is carried out through mail, utilizing email addresses obtained from two branch organizations within the sector. Additionally, the company supervisor assisted in identifying other email addresses than available on the internet. A potential drawback of this approach is the likelihood of surveys not being completed (Babbie, 2021). To mitigate the issue of non-response, this thesis was promised to be returned to the participants, so they obtain the knowledge gathered by this research which can be useful for their company. When response through the previous explained methods was rather low, the survey was sent to more bakeries that could be found on the internet. More than 400 bakeries were structured per province and emailed at once, which give a somewhat higher response rate.

### Survey technique

Survey research is especially useful approach when a researcher aims to describe or explain characteristics of a large group (Babbie, 2021). It is also used to gather quick data from the population of interest and prepares for a more focused, in-depth study (Babbie, 2021). For this research the survey

is used to gather general information from the sector on the two concepts in relation with the strategic niche management theory. This survey determined what the status quo of SR and CIP is, and how many SMEs in the sector are applying these two phenomenon within their business strategies. Survey research offers the advantage of efficiently targeting a large sample in the population simultaneously, making it a time-efficient method (Babbie, 2021). It is also considered reliable since each participant responds to the same set of questions, ensuring consistency. However, surveys do have weaknesses, particularly in terms of inflexibility and validity (Babbie, 2021). To address inflexibility, a mock survey was conducted to eliminate vague and redundant questions. Ensuring validity involves the second phase of the research, which delve deeper into the superficial answers provided during the survey.

There are different types of surveys that can be used to investigate the population. In relation with time, there are two main types (Babbie, 2021). The cross-sectional surveys are administered at one point in time, and longitudinal surveys are used over an extended period of time. Because of the time limits and purpose of the survey, a cross-sectional survey was used. The limitation of this type of survey is that the outcomes are only generalizable for the moment in time when the survey is taken (Babbie, 2021). Therefore, the findings of this thesis are reflective of the specific timeframe during which it was conducted.

The survey is conducted by identifying all topics of the research, creating clear and to the point questions without wasting the time of the respondents (Babbie, 2021). The concepts are simply written out in the survey so all respondents are aware of the topics, and how they are used in this research. The questions are all based on literature to ensure that the answers on the survey are in line with the literature of this research (Babbie, 2021). Context, language barriers and biases are also taken into account, simple wording is used, and if applicable, sector jargon is used (Babbie, 2021). The use of loaded words, non-neutral wording and steering questions are avoided. Ambiguity is avoided by testing the survey with the hosting company. In survey research, social desirability often occurs especially on topics where enterprises want to be in good light for society. To counter this, questions are asked in a benign way. This is done by imagining if the researcher would answer the question if they were in the shoes of the respondent. If the answer is 'no', the question was not asked (Babbie, 2021).

Some answers of the survey are displayed in a 2x2 matrix, because this design visualizes the interaction effect between two variables (Malhotra et al., 2000). For this research the two variables SR and CIP, including the levels present and absent, are used. This distribution will give four different groups. A visualization of this matrix can be found in table 3.

Table 3: 2x2 matrix SR/CIP

Sustainability reporting (SR)	Circular innovation practices (CIP)	
	Present	Absent
Present	-	-
Absent	-	-

### Interview strategy

Following the emergence of survey results, a non-probability sampling technique was employed to choose interviewees from the survey respondents.

Three interview types are recognized: structured, semi-structured, and unstructured interviews (Patton, 2015). The chosen method is semi-structured interviews, allowing the researcher to include guiding questions on the topic and pose follow-up questions to explore phenomena and underlying

reasons in an in-depth manner (Patton, 2015). This method fosters two-way communication between the interviewee and the researcher, facilitating the acquisition of comprehensive information related to the research topic (Patton, 2015). Structured interviews do not allow these follow-up questions (Patton, 2015), and unstructured interview are less comparable which is suboptimal for this research.

As previously explained, two interviewees aimed to be selected from each quadrant of the 2x2 matrix. One of the techniques, the snowballing technique, wherein one interviewee recommends another, is not applicable to this research as it doesn't focus on stigmatized groups, and the survey facilitated easy sample identification, rendering recommendations unnecessary (Palys & Atchison, 2014). The purposive sampling approach aligns with the specific perspectives the study aims to explore. In this research, characteristics from the matrix must be considered for selecting interviewees, making purposive sampling a suitable method (Palys & Atchison, 2014). However, the quota sampling technique is even more fitting as this method categorizes based on characteristics, and samples are drawn from clusters (Palys & Atchison, 2014). Since the survey organizes the population into the 2x2 matrix, it simplifies the selection of samples from these groups. Although convenience sampling could have been an option, it is not suitable for this study, as in-depth information from the population is required. Convenience sampling often provides only superficial information about the phenomenon at hand (Palys & Atchison, 2014). Interviewers often cease conducting interviews when new participants fail to provide different answers from those already obtained, a phenomenon known as saturation (Knott et al., 2022). However, achieving saturation is often impractical within the time constraints of research, including the present study. Therefore, a predetermined sample size is selected to ensure the acquisition of rich and specified data (Knott et al., 2022). However, the survey did not allow the research to selected 2 respondents out of each quadrant because of absence and willingness to participate. For group B (table 4), this was expected because reporting about sustainability without having circular practices in place is not logic. Group D had some respondents in the survey, but only one of them was willing to provide an interview. The ones that filled out the survey in this box, were e-mailed again, with the notice that interviews are held with complete anonymity, however no reactions on this email returned. The reasons behind unwillingness of participation remains undiscovered. To fill these gaps, an overarching company is implemented within the research which has much knowledge about the sector. Therefore, 6 interviews were held. 5 of these respondents can be placed in one of the quadrants of the matrix, and one outside of the matrix. Tabel 4 shows the interview respondents. Unfortunately, an industrial bakery is not included because, in the survey, respondents were asked if they were willing to participate in an interview. Regrettably, none of the industrial bakery respondents were willing to be interviewed.

Table 4: interview respondents

Sustainability reporting (SR)	Circular innovation practices (CIP)	
	Present	Absent
Present	Group A	Group B
	R1 (middle-sized, artisan) R5 (middle-sized, mill)	
Absent	Group C	Group D
	R3 (micro-sized, artisan) R4 (middle-sized, artisan)	R2 (micro-sized, artisan)
Overarching	R6 (large-sized, retailer)	

To organize the semi-structured interviews, a topic guide was utilized, outlining questions pertaining to each research topic (Appendix B). The inclusion of probing and clarifying questions aims to enhance the depth of the interviews (Knott et al., 2022). Consequently, specific details and illustrative examples relevant to each topic were gathered.

### Data analysis

The survey comprises various question types categorized into dichotomous, nominal, ordinal, interval-level, and ratio responses. Different analysis techniques are applied corresponding to these response types. Specifically, for combining variables, the CHI-test is employed with a significance ratio of  $<0.05$ . The CHI-test assesses the relationship between two categorical variables, useful for discerning reactions among the groups outlined in the matrix. Unfortunately, some questions are filled out by a small portion of respondents, some results could not be treated statistically. Results are presented by cross tabs, graphs, and charts.

To facilitate data analysis from recorded interviews, a transcription is made per interview using online software, subsequently reviewed and corrected by the researcher (Knott et al., 2022). The manner of responding during interviews is considered irrelevant, and hence, non-verbal observations are not documented, employing what is known as intelligent verbatim (Knott et al., 2022). Despite the fact that post-positivism acknowledges the importance of context and subjectivity of non-verbal communication, this study prioritizes the verbal content of interviews to maintain clarity and focus (Knott et al., 2022). Non-verbal communication can introduce ambiguity and subjective interpretations, potentially obscuring the objective analysis of the data. Thematic analysis is then utilized to extract themes from participants' responses. This involves iteratively developing codes through careful reading and re-reading of transcripts. The researcher ensures codes are distinct and non-overlapping (Knott et al., 2022). This form of coding resulted in three coding cycles. First structural codes are applied to the transcripts, then the codes are addressed to the different themes within the transcripts, and lastly the codes are merged. The codebook can be found in appendix A.

Once the coding process was completed, the analytical phase commenced, involving iterative examination of the data to derive results. Throughout this process, the researcher ensured that the conclusions drawn are supported by the dataset (Knott et al., 2022). All these procedures are conducted using the online software ATLAS.ti.

### 4.3 Validity, reliability and credibility of the research

To create an understanding of validity, reliability and credibility the definitions of terms are given, starting with validity. According to Leung (2015), "validity in research can be understood as the appropriateness of the tools, of the process and of the data" (p. 325). This researcher emphasized that to get an answer on the main-question, de paper design, its methodology, sampling strategy and data analysis are crucial.

Critical indicators assessing the quality of measurements encompass internal validity, external validity and reliability (Kimberlin & Winterstein, 2008). Internal validity can be achieved by linking dependent and independent variables and operationalisation (Crocker & Algina, 1986). Within this research the dependent and independent variables are linked by the research questions and the chosen research methods. The variables are operationalized by different models and theories found in the literature (ladder of Moerman and SNM theory (Lehmann et al., 2022; Smith & Raven, 2012). External validity is the level to which the results of a study can be generalizable for the target population (Cocker & Algina, 1986). Clearly defining the scope of the research helps to achieve external validity. For this study this

is done by making use of the 2x2 matrix in which the respondents of the survey will be divided. The chosen respondents of the interviews are chosen out of this matrix with as much variation as possible. Furthermore, size and location in the sector matters and was taken into account while determining the scope of the research. Because of limited time and limited willingness to participate in an interview, the results will never be generalizable for the total population. Temporal validity, another aspect of external validity (Munger, 2023), is difficult to achieve because the reporting landscape and sustainability attempts are constantly changing (Homrich et al., 2018; Opferkuch et al., 2021).

Reliability, in its turn, pertains to the replicability and consistency of measurements (Lehner, 1997). To ensure replicability, there is made sure that the research is carried out in a transparent manner, where all details are known (Van Thiel, 2014). For literature this is done by comparing different scholar writing about similar topics and by creating a clear research plan which was followed throughout the total research process. Consistency of the research is achieved by a clear interview guide which was used for all interviews. Furthermore, the coding schemes are applied to all transcripts of the interviews which will create consistency in the findings. The collected data is compared with literature to see whether it was accurate and reliable.

Bryman (2016) mentions the importance of credibility in research and refers to “How believable are the findings?” (p. 44). The research goal is to determine to what extent SR influences the adoption of CIP. To meet this goal, the mixed-method strategy was used. This strategy is enhancing the credibility of this research because of data triangulation (Creswell, 1999). Triangulation is established by literature review, a survey and the in-depth interviews. The empirical data is gathered in Dutch, which made it easier for both researcher and respondent to communicate with less interpretation and understanding issues.

Figure 4 shows the total research process.

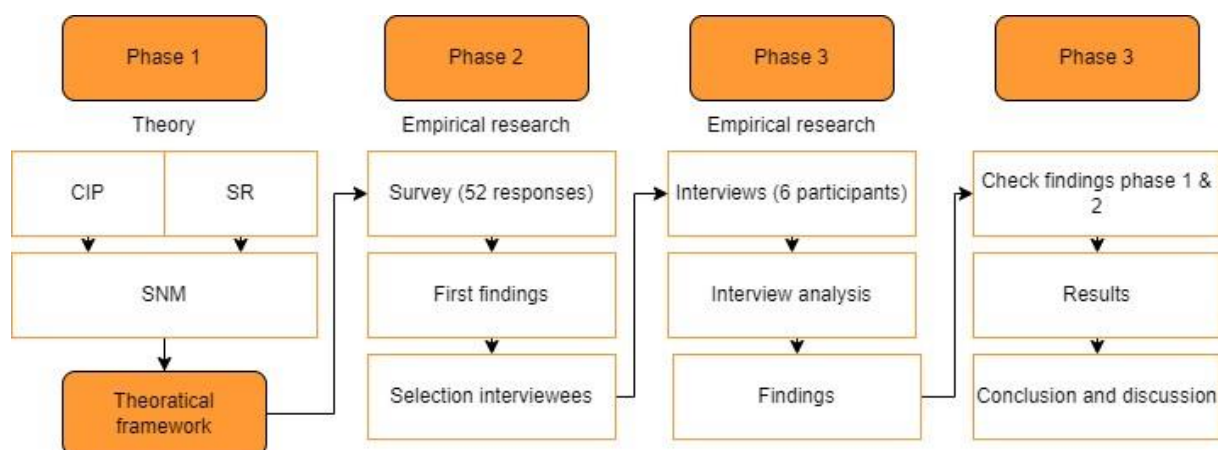


Figure 4: Research process

## 5. Results

This chapter reveals the results of this research and is divided in three subparts. Firstly, the role of sustainability reporting in management of the SMEs is presented, hereinafter the current implementations of CIP according to the ladder of Moerman, and lastly the role of SR in the uptake of CIP is presented.

To start off, the respondents are divided in the 2x2 matrix as described in the methodology chapter. This matrix is displayed in table 5.

Table 5: 2x2 matrix respondents

Sustainability reporting (SR)	Circular innovation practices (CIP)	
	Present	Absent
Present	Group A	Group B
	2 <10 employees	
	6 11-50 employees 4 51-250 employees	
Absent	Group C	Group D
	9 <10 employees	2 <10 employees
	16 11-50 employees 5 51-250 employees	1 11-50 employees

This table shows that the majority of the respondents have implemented CIP in their organisation. The implementation of SR is lacking.

### 5.1 Role of sustainability reporting in management

This sub-chapter is divided in formal reporting and informal reporting. For those two parts, first, general information is presented, hereinafter the role of reporting in the management is described. This is mostly done by explaining which stakeholders are important to for management because as can be read in the theoretical chapter, the role of sustainability reporting in lays particularly in the management of stakeholders (Smith & Raven, 2012).

#### 5.1.1 Formal reporting

##### General information

Results show that reporting is not common good for the bread production sector. Only 26,7% of the organisations have adopted reporting strategies within their business plan. After running a chi-square test with company size and whether companies report, no significant result was found. This means that the factor 'size of a company' is not associated to whether a company reports on sustainability. This means that approximately 73,33% of all size groups have not implemented any SR practices.

Tabel 6 shows that almost 67% of the reporting companies are reporting formal (8 out of 12). From the total sample size, this is only 13%. Companies with less than 10 employees (micro) report in an energy report and the annual accounting report, however this is only one respondent who does so. The small companies who report formally do this in an energy report and one also reports in the annual accounting report. The middle companies (51-250 employees) all report in the annual account report and one is also reporting according to the GRI-standards. So all the companies who report, do this in their annual accounting report (table 6). There is no significant association between company size and

formal reporting channel. So, also for this variable, company size does not have an influence on way of reporting.

Table 6: Crosstab 1

Hoe groot is het bedrijf waar u werkt? * Op welke formele manier rapporteert u (meerdere antwoorden zijn mogelijk)? Crosstabulation		Op welke formele manier rapporteert u (meerdere antwoorden zijn mogelijk)?						Total
		Ik rapporteer alleen informeel	In een energierapport aan de overheid	In het jaarlijkse accounting rapport	In het jaarlijkse accounting rapport, In een energierapport aan de overheid	Volgens global reporting initiatie (GRI) standaarden <a href="https://www.metenvanduurzaamheid.nl/overzicht-tools/monitoring-als">https://www.metenvanduurzaamheid.nl/overzicht-tools/monitoring-als</a>		
Hoe groot is het bedrijf waar u werkt?	<10 werknemers	Count	1	0	0	1	0	2
		Expected Count	,7	,5	,3	,3	,2	2,0
	11- 50 werknemers	Count	2	3	0	1	0	6
		Expected Count	2,0	1,5	1,0	1,0	,5	6,0
	51 - 250 werknemers	Count	1	0	2	0	1	4
		Expected Count	1,3	1,0	,7	,7	,3	4,0
Total	Count	4	3	2	2	1	12	
	Expected Count	4,0	3,0	2,0	2,0	1,0	12,0	

### Role in management

Reasons to report in a formal manner for the reporting companies is because of different stakeholders. The formal reporting micro company does this for clients and competitors, the small companies do this for the public sector, but also for employees, and the middle companies are reporting formally for clients, employees, public sector and shareholders (table 7). Again, there is no significant association between size of the company and shareholder reporting for (p 0.224). In addition, there is also no significant association if the formal reporting respondent inserted CIP in their company (p 0.910). Thus, when examining the matrix in table 5, it is not possible to distinguish between important stakeholders and groups A and B. This is mainly due to the absence of respondents in group B.

Table 7: Crosstab 2

Crosstab		Voor wie rapporteert uw bedrijf formeel voornamelijk?						Total	
		Concurrenten	Ik rapporteer alleen informeel	Klanten	Medewerkers	Publieke sector (overheid)	Shareholders		
Hoe groot is het bedrijf waar u werkt?	<10 werknemers	Count	1	0	1	0	0	2	
		Expected Count	,2	,2	,3	,3	,8	,2	2,0
	11- 50 werknemers	Count	0	1	0	1	4	0	6
		Expected Count	,5	,5	1,0	1,0	2,5	,5	6,0
	51 - 250 werknemers	Count	0	0	1	1	1	1	4
		Expected Count	,3	,3	,7	,7	1,7	,3	4,0
Total	Count	1	1	2	2	5	1	12	
	Expected Count	1,0	1,0	2,0	2,0	5,0	1,0	12,0	

As can be seen (table 7), the primary stakeholders suppliers and investors are not mentioned as driver to report formally. The secondary stakeholder environment is also not mentioned.

One motivation for companies report formally, is to make their business quantitative transparent. “Through formal reporting, we make our information more explicit for are stakeholders outside of the company” and “I think that it is very important for the branch, so great benchmarks can be made between companies, so greenwashing is not possible” (R5). This respondent adds “I think it will eventually be our right to exist, but for now it is important to keep our shareholders involved in our way of doing business” (R5). The smaller companies see some advantages in reporting as well: “Then

we can see what we have done in the past and what we are doing now. Some things can only be known if you keep information” (R3) and “I think it will be more important for our consumers as well to know what they are eating and it even can give commercial advantageous” (R3). Other small companies only see advantageous for the larger companies; “the advantage is specifically for large companies so they become more quality-conscious” (R2).

### **Reasons to not implement in management**

Yet, the companies also see disadvantages in formal reporting, and state reasons why they do not take reporting up in their management strategies; “I am sure companies just create a nice story. I also knew for quality controls which steps I had to take to not be rapped on the knuckles” (R2), “The information in reports does not have to be correct. The reporting companies know that there is not much control so they are willing to take the risk”(R3).

Motivation for companies to not report formally is because the SME bakeries state that they are not adding value to their businesses and that they are not obligated by any stakeholder to do so (R2, R4). However, some companies are expecting this to change because of the new directive (CSRD). R1 states for example: “a chain reaction will follow. There are already large companies who are obligated to report. And we supply these companies, so we will get the questions about our exact data”, and “I know these clients will come with questions, and always earlier than expected”. Another respondent (R4) says: “If the large companies have their formal reports settled, than I expect that for us there will be more pressure to also do so, however this will be a very slow process. And then, we will have no choice”.

As can be read in the previous citations and which is a recurring pattern is that all the respondents are finger pointing large companies to start reporting first. They are not willing or are able to take first steps. The SME companies are expecting formats to fill out their data and expect from the large actors in the chain. “And then I will ask, which format do you have for me” (R1), “I need to know, how can I report and in which format?” (R3), “I need help from my suppliers because they are further in the reporting process” (R4). Luckily the larger companies in the chain (R5 and R6), are willing to pull the chart. In fact, they see it as their responsibility to do so: “Bakers are ultra conservative, there are not able to figure this out themselves, so I think that we are obligated to steer them in the right direction” (R6), “there are not many bakers with much knowledge in this area, so we think it is our role to answer the questions they have” (R5). However, these larger companies were also not able to set up formal reporting on their own. They also needed help from external parties or extra employees to be able to report. “An external party helps us to make the necessary information measurable, so we are trying to support the information in our report scientifically” (R5), “The company made a special function for me to figure this out” (R6).

Motivation is not the only reason to not report formally, ability is also a factor. “Formal reporting is too specific to, ‘just’ add in management” (R1), and “I do not have the knowledge to do so” (R4), “the communication is too difficult because there are so many rules. I have to walk on my toes to not mention certain terms that I am not allowed to use. Maybe there are simple and good ways, but I do not know how I can communicate” (R3). However, there is a small company that does not see any ability issues when it comes to formal reporting, and refers back to motivation: “I think every company is able to do so, only motivation is a problem” (R2). R5 does also not see any ability problems and mentioned “every company will be able in its own manner, and not directly form the cellar to the attic. For smaller companies will it take a longer time than for large companies”.

### 5.1.2 Informal reporting

#### General information

As shown in figure 5, 25% of the reporting respondents is only reporting in a formal manner. This means that 75% of the reporting respondents is reporting informal. From the total sample size, this is only 18%. Table 8 indicates that companies with fewer than 10 employees (micro-enterprises) report on their website, LinkedIn, and other social media channels. However, similar to formal reporting, this observation is based on a single respondent. The small companies who report informally do this on social media channels, on the website and by email. The middle companies (51-250 employees), report through a newsletter, LinkedIn, social media channels and by email. In total, 67% of the informal reporters use social media as channel to report. There is no significant association between company size and informal reporting channel ( $p = 0.631$ ), so the size of the company is not associated with the informal reporting channel.

Table 8: Crosstab 3

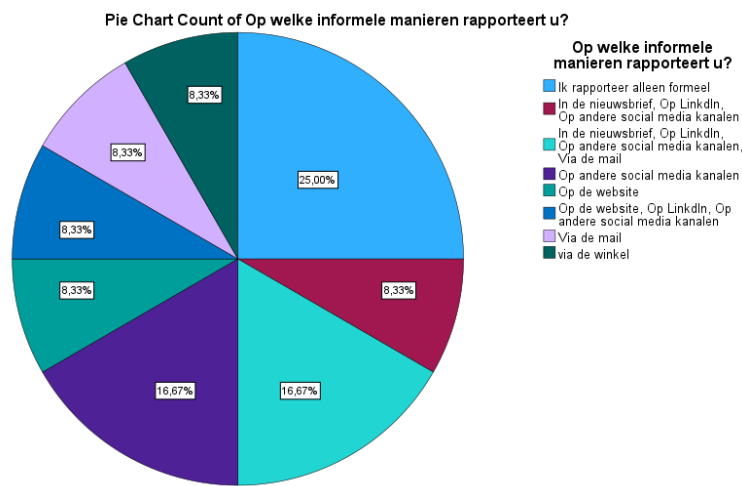


Figure 5: Pie chart 1

Op welke informele manieren rapporteert u? \* Hoe groot is het bedrijf waar u werkt? Crosstabulation

Count		Hoe groot is het bedrijf waar u werkt?				Total
		<10 werknemers	>250 werknemers	11- 50 werknemers	51 - 250 werknemers	
Op welke informele manieren rapporteert u?	1	11	1	17	5	34
	Ik rapporteer alleen formeel	1	0	1	1	3
	In de nieuwsbrief, Op LinkedIn, Op andere social media kanalen	0	0	0	1	1
	In de nieuwsbrief, Op LinkedIn, Op andere social media kanalen, Via de mail	0	0	0	2	2
	Op andere social media kanalen	0	0	2	0	2
	Op de website	0	0	1	0	1
	Op de website, Op LinkedIn, Op andere social media kanalen	1	0	0	0	1
	Via de mail	0	0	1	0	1
	via de winkel	0	0	1	0	1
Total		13	1	23	9	46

### Role in management

Stakeholders influencing companies to report informally vary according to company size, as shown in Table 9. Micro-enterprises report informally for clients and suppliers, small companies for clients and employees, and medium-sized companies for investors, clients, and employees. Despite these variations, there is no significant association between company size and informal reporting due to stakeholders ( $p = 0.631$ ). Thus, while the company's size does not affect which type of stakeholders drive informal reporting, it is evident that stakeholders play a significant role in this process. The stakeholders government, environment, competitors, shareholders and suppliers are not mentioned as stakeholders driving informal reporting practices.

Table 9: Crosstab 4

**Voor wie rapporteert uw bedrijf informeel voornamelijk? \* Hoe groot is het bedrijf waar u werkt?**  
**Crosstabulation**

Count

		Hoe groot is het bedrijf waar u werkt?			Total
		<10 werknemers	11- 50 werknemers	51 - 250 werknemers	
Voor wie rapporteert uw bedrijf informeel voornamelijk?	Ik rapporteer alleen formeel	0	2	0	2
	Inversteeders	0	0	1	1
	Klanten	1	3	2	6
	Leveranciers	1	0	0	1
	Medewerkers	0	1	0	1
	Medewerkers, Klanten, Leveranciers.	0	0	1	1
Total		2	6	4	12

### Adoption, extent and quality

According to Carmo and Miguéis (2022), reporting can be measured by the adoption, extent and quality. The adoption is explained in the role of management for both informal as formal reporting. The extent of reporting is also different per stakeholder (figure 6-11). As can be seen, employees are the stakeholders most frequently reported for. The government and competitors are addressed least often. This is logical, because previous results showed that these stakeholders are not motivators for companies to report in an informal manner. What is surprising is that suppliers are addressed a several times per year, while they were not mentioned as driving stakeholders in this current research. The often mentioned stakeholder client, is reported for in a quantity between more than once per quarter and more than one per year. This difference with employees can be declared by the accessibility of the stakeholder (Theodoulidis et al., 2017). Employees are involved in a company and the contacts are closer. As the stakeholder investors is only mentioned one time for driving stakeholder, they are somewhat structurally addressed to by companies. The bar chart indicates that stakeholders are mentioned as the reason for reporting either a few times per year or less than once a year.

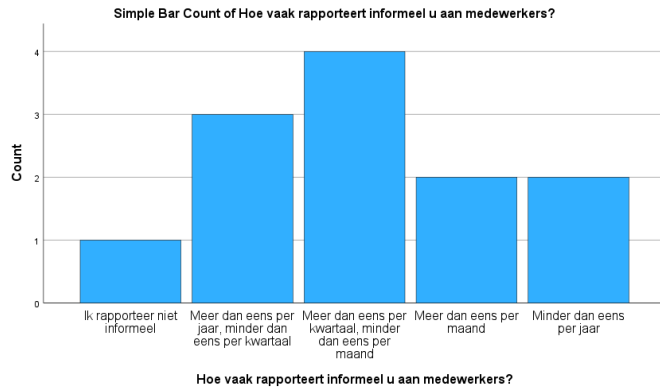


Figure 6: quantity employees

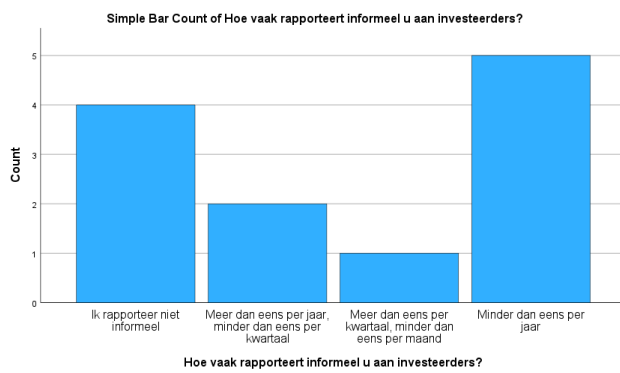


Figure 7: quantity investors

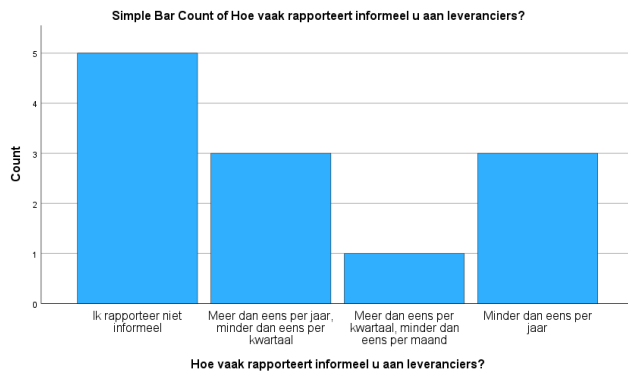


Figure 8: quantity suppliers

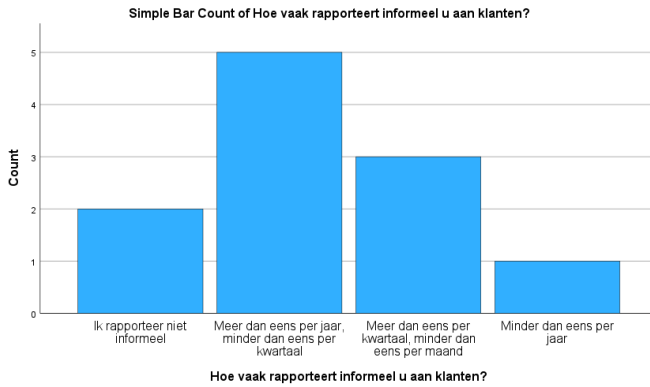


Figure 9: quantity clients

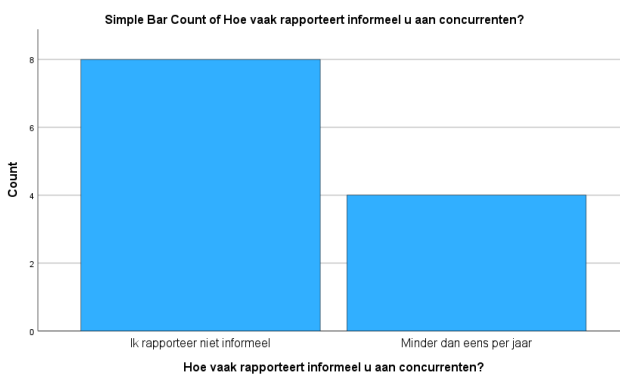


Figure 10: quantity competitors

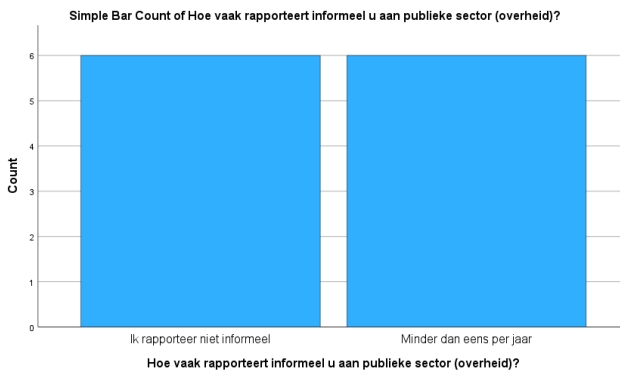


Figure 11: quantity government

The quality of reporting is about what is described in the reports (Carmo & Miguéis, 2022). “We report to inform that we have improved the sustainability within our company. That is how we deal with new innovation” (R5), “we always made a newsletter to let our clients know what we had done that week” (R3). Many companies are struggling with informal reporting because of time: “I want to set it up but it takes time” (R2), “time is always an issue for these kinds of things” (R3). The middle sized companies are doubting the transparency of informal reporting: “Everybody can choose its own benchmark. I can say in the we have reduced 25% CO2 emissions in the last 10 years, but in the last 5 years this can be only 2%. This makes comparing very difficult” (R5). R6 says: “Stop lying and start telling the truth”. The smaller companies also see issues: “I am often bothered by large companies who play it in such a

manner that it seems like they are sustainable, but actually they play with the emotions of the consumers” (R3).

What the statistical analysis already showed is that employees are important stakeholders for informal reporting. R5 says “if a factory employee is asked what we are doing about sustainability, we want them to know the answer”. R1 states “if we write about it internally, it starts to live within the company and we have to do something about it” (R1). Suppliers are also important for this company because “we want to be able to answer the questions asked by suppliers about this subject” (R1).

The company with only business to business trade does see clients as important stakeholders because for this company, more questions about this matter are coming from clients and therefore, the company is eager to report about it (R5). Different sorts of information is shared within both the formal as informal reports. The environmental values that are being mentioned in the reports are mainly energy use and use of materials (figure 12). Co2 emissions, water use and impact on biodiversity are also mentioned. Some companies mentioned that they are not reporting about any of the environmental value aspects. Which environmental values they do report about is unknown. The social values that companies report about is mainly the treatment of employees in the supply chain. Inclusivity and diversity, influence external social groups and transparency are also somewhat mentioned. However, 50% of the reporting respondents are not mentioning any of these social aspects in their reports (figure 13). The governmental values are also for only 50% mentioned in the reports. Companies that do report about governmental values, mostly describe the transparency of decision making and company strategy. The hierarchy of the companies is mentioned, but is more scarce than the other governmental values. (figure 14).

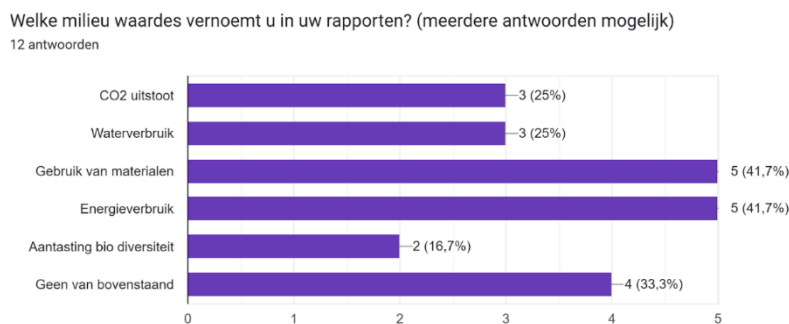


Figure 12: Barchart 1

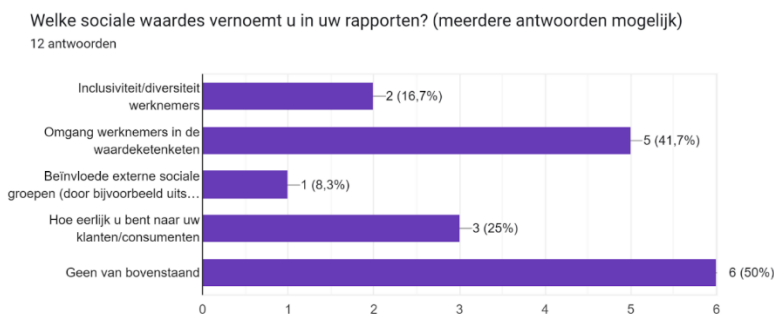


Figure 13: Barchart 2

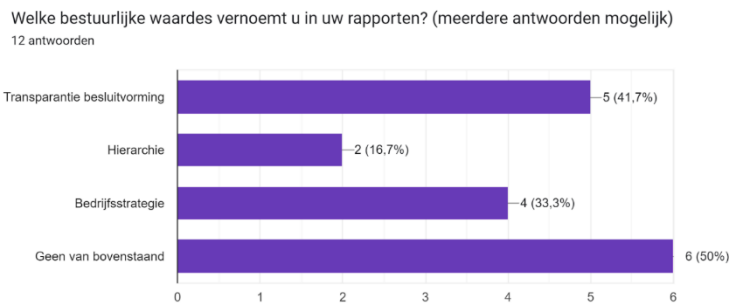


Figure 14: Barchart 3

Table 10 compares the stakeholders involved in informal and formal reporting. It reveals that companies which do not engage in informal reporting only report formally for the public sector. Among the respondents, three primarily report informally for clients while reporting formally for the public sector. As indicated in the table, only two respondents identified the same stakeholders (clients and employees) as drivers for both formal and informal reporting. This means that there is a difference in the involvement of stakeholders in formal and informal reporting. If formal reporting practices are implemented within a company, they are exclusively for the public sector. Simultaneously, if only informal reporting practices are used, they are limited to clients.

Table 10: Crosstab 5

**Voor wie rapporteert uw bedrijf informeel voornamelijk? \* Voor wie rapporteert uw bedrijf formeel voornamelijk? Crosstabulation**

Count

		Voor wie rapporteert uw bedrijf formeel voornamelijk?						Total
		Concurrenten	Ik rapporteer alleen informeel	Klanten	Medewerkers	Publieke sector (overheid)	Shareholders	
Voor wie rapporteert uw bedrijf informeel voornamelijk?	Ik rapporteer alleen formeel	0	0	0	0	2	0	2
	Inverteerders	0	0	1	0	0	0	1
	Klanten	0	1	1	1	3	0	6
	Leveranciers	1	0	0	0	0	0	1
	Medewerkers	0	0	0	1	0	0	1
	Medewerkers, Klanten, Leveranciers.	0	0	0	0	0	1	1
Total		1	1	2	2	5	1	12

Figure 15 shows that nearly 70% of respondents report solely information they believe is legally required. This finding is surprising, given that none of the respondents are legally obligated to do so. One possible explanation for this discrepancy could be the lack of clarity in reporting standards and limited experience in reporting among SMEs (Agostini, Costa, & Bagnoli, 2018). Additionally, figure 16 shows that almost 60% of the reports cover both current and future business strategies, while 40% focus solely on current strategies. There are no reports that address only future perspectives, which is in conflict with the literature (Hopwood et al., 2005).

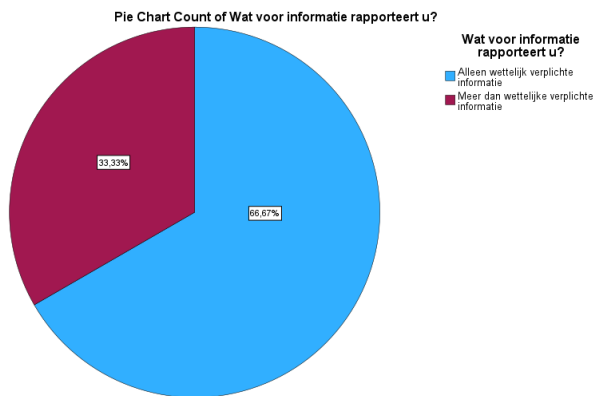


Figure 16: Pie Chart 2

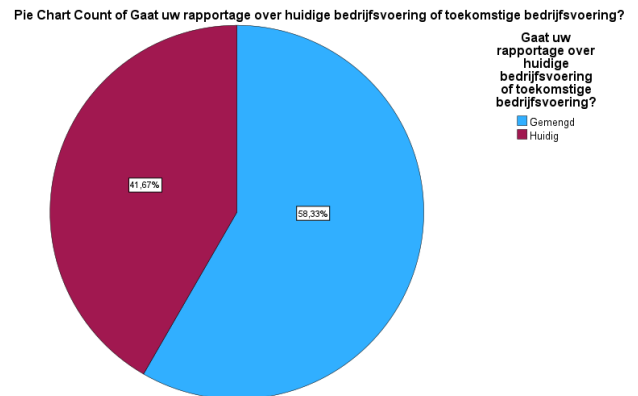


Figure 15: Pie chart 3

### Reasons to not implement in management

R1 is consciously not feeding its clients about sustainability because they also want to give information which is supported by data, but the data is missing. R4 is adding: “I think that you should not do it for your clients, but for yourself. I think for the client it does not matter if the bread is sustainable or not, if t the price and taste is good, the client will continue buying”. “I do not think more clients will enter our shops if we would report informally” (R4).

According to the statistical analysis, reasons to not report are mainly because the companies do not see any advantage in reporting or because it is not legally required to do so (figure 17).

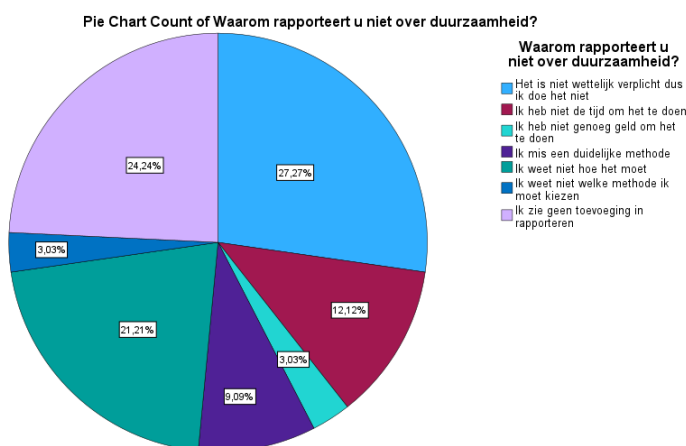


Figure 17: Pie Chart 4

All companies that report, have implemented CIP within their business strategies.

As described in the theoretical chapter, SNM enables three different niche-building processes for the development of innovations which is the management of niches. These processes are articulation of expectations and visions, network building and learning (Geels et al., 2011). These are complementary

and provide an understanding of how innovations drive and emerge. Therefore, below is described how reporting is present in the sector by using these three aspects.

### **Articulation of expectations and visions**

Articulation of expectations and visions involves defining clear and shared goals for innovation, helping align the efforts of various stakeholders (Geels et al., 2011). In the context of the bread production sector, this process is not widely adopted by reporting. According to the data, only 26.7% of companies have incorporated reporting strategies into their business plans. This low adoption rate suggests that many companies have not yet articulated their visions and expectations of sustainability goals.

### **Network building**

Network building involves creating networks with diverse stakeholders who support the innovation (Geels et al., 2011). These networks are essential for sharing knowledge, resources, and experiences. In the bread production sector, network building by reporting is limited. Almost 67% of reporting companies do so informally, primarily through social media channels (Figure 6). Smaller companies report through websites, LinkedIn, and other social media, while middle-sized companies use newsletters and email. This informal network building indicates a preference for less structured and more flexible communication channels. This is not in line with strategic niche management (Smith & Raven, 2012). Yet, the larger companies' belief that it is their responsibility to lead and support SME bakeries in reporting, acknowledges the need for external support and addressing capability gaps for SMEs, indicating that by reporting more networks are constructed. This dynamic of larger companies setting precedents and providing necessary frameworks indicates the moral and ethical responsibilities they feel towards the smaller companies, thereby driving the niche creation for sustainability reporting by building a network which can be used for help.

### **Learning Processes**

Learning processes in SNM involve experimenting with and refining innovations based on feedback and experiences (Geels, 2002). In the bread production sector, formal reporting is driven by stakeholder requirements rather than intrinsic motivation. Reasons for formal reporting include transparency and benchmarking, which are seen as essential for preventing greenwashing and ensuring business viability (R5). This relates to first order learning which is related to facts and data (Schot & Geels, 2008). Smaller companies view reporting as beneficial for historical tracking and potential commercial advantages (R3), which also relates to first-order learning. However, many companies see disadvantages in formal reporting, such as the potential for creating misleading narratives and the lack of stringent controls (R2, R3). This concern is related to second-order learning which is related to breaking patterns (Schot & Geels, 2008). However, external pressures for reporting can create a niches for smaller companies start adopting circular innovation practices, with respondents indicating that larger companies' obligations and examples will trickle down to them, requiring them to report about circular innovation. These smaller companies can thus learn from the larger companies.

## **5.2 Adoption of niches**

As described in theory, CIP is measured by the Ladder of Moerman (Lehmann et al., 2022). The results of this chapter will also be structured by this ladder. Furthermore, residual information about CIP is given and SNM theory is applied at the end of this sub-chapter.

### **Prevention**

As can be seen in figure 18, almost all of the respondents have implemented the first step of the ladder of Moerman (avoiding food waste) within their business strategy (93,33%).

Pie Chart Count of *Zorgt u ervoor dat het aanbod aansluit op de vraag zodat er zo min mogelijk reststromen worden geproduceerd?*

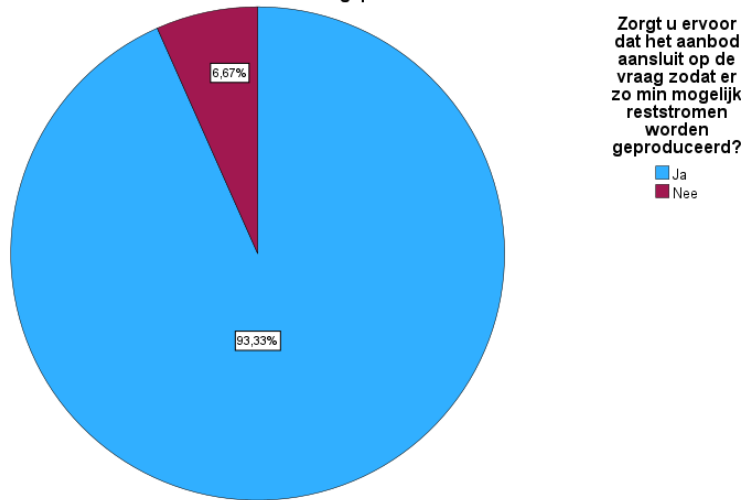


Figure 18: Pie Chart 5

This is mostly done by monitoring the sales, producing on demand and minimizing stock. The reasons to minimize avoid food waste is sometimes economic: “the less we overproduce, loss of turnover is minimized” (R2). “if you stop overproducing, you do not need methods to recycle your residual flow, which always costs time and money”. A larger company (R6) says: “if you have a better margin, you lose less money”. “We choose for every month 10 pallets of raw materials, instead of 60 pallets per half year, because stock always costs money, and in this manner we can better predict what we need” (R1), “of course, you do not want to waste food, but on the other hand, for us is also a financial motivation to not waste food because we don’t earn on waste” (R3). A second reason to avoid waste for companies comes from intrinsic motivation. “I think to treat residual flow in a right way, keeps the value of the products high” (R1). “I saw how not sustainable coffee production was, I knew the bread production could be much more sustainable because the lines are shorter” (R3). “For us it is out of intrinsic motivation, we want to be as sustainable as possible, and to avoid food waste is part of this” (R5). The last motivation to avoid food waste is to serve others: “we do not prevent food waste for ourselves, but to help others such as the farmer who can feed its stock, or the people with less money who can buy residual bread against a reduced price” (R4).

For the mill company it is easier to avoid food waste than for bakeries, because they produce on the basis of contracts with other businesses and not direct with consumers. This means that they exactly know what they will sell. For bakeries this is harder to predict, because “if it is snowing the whole day, nobody is buying bread anymore” (R4). The prediction methods of the companies are different. R4 predicts on internal gut, R2 predicts by a systems which is tracking sales for many years now. Large bakery, R1 only started to predict this year. “previously, if I wanted to bake a certain amount of bread, I just baked, now I know that that is not the way to go”. One company even says that prediction is never the way to prevent food waste (R6): “It is a fundamental mistake to bake based on prediction” (R6). Because still, bakeries overproduce, and is not prevented by prediction. The range of kilo’s overproduced per day of the respondents is from 0-3000kg. The respondents of the interviews mention that it is approximately 10% residual waste over the total production. “I think per day the residual flow

is around 10%" (R3). "We have 750 kg of residual flow per day, I think that is 10% of our total production" (R4). As mentioned in theory, this 10% together results to 700.000 residual pieces of bread per day (Timmermans, 2022).

The primary obstacle for the first layer of the ladder is the absence of precise prediction methods due to the variability in bread sales dependent on weather conditions. All respondents emphasize the difficulty in making accurate predictions, with remarks such as "It is always a matter of conjecture" (R3), "the prediction is never exact" (R1), "I would like to have a better prediction system" (R4), and "the way of doing business is very vulnerable" (R6) due to fluctuations in supply and demand. Another challenge is the lack of interest among sellers in reducing food waste, as they are often untrained to predict sales and are unaffected economically if bread remains unsold, leading to indifference towards waste reduction throughout the supply chain. Additionally, the practice of night baking presents a barrier to implementing change, with one respondent suggesting a shift to day baking to enable real-time adjustments to production and reduce bread losses. The overarching system, built on overproduction to meet consumer expectations of daily fresh bread, poses another significant challenge. This notion is critiqued as "total nonsense" (R6), with the entire chain sustaining overproduction to maintain high turnover. Lastly, societal expectations of daily fresh bread are criticized as unrealistic, with one respondent describing it as "total bullshit" (R6) and advocating for a re-evaluation of freshness standards. Despite these obstacles, some bakers remain steadfast in their commitment to providing daily fresh bread (R1, R3, and R4).

### **Use for human food**

The next layer, is also adopted in many business strategies (figure 19). However, R6 believes that everything below the first layer of the ladder is value loss. "Doing something sustainable with your residual flow is value loss, period. That is why the problem should be handled at the core, and that is less production" (R6). Yet, companies do different things with their residual flow for human food. Mostly, Too Good To Go is used, and some respondents bring their bread to the food bank, where it is given to families with fewer financial resources (R2, R3, R4). Too Good To Go is an organization that enables companies with surplus food to sell it at a reduced price. Another adopted strategy is 'bread from yesterday,' where companies sell the bread they made the previous day at a discounted rate.

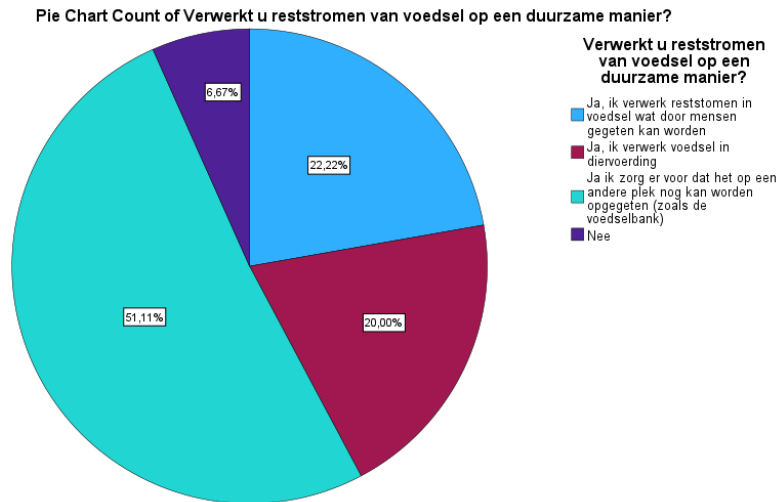


Figure 19: Pie Chart 6

For the second layer, the obstacle appears that bakeries are not willing to totally serve the customers which rely on the cheap products. “We want customers to come the entire day, not only around 17:00 in the afternoon” (R4).

### Conversion into human food

22% of the respondents (figure 19) have implemented the third layer of the ladder into their organization, converting residuals into human food. This conversion is done in various ways. For example, R1 converts their residual bread into beer and also sends part of it to Bakkersgrondstof to make sourdough, which is then used to make sourdough bread that is 30% circular. These are both recent processes. R3 uses residual patisserie to create other products: “We can, for example, use the patisserie in our almond croissants, and we also found a recipe for sweet bread pudding” (R3). R4 utilizes residuals to make sausage bread. For the milling company, it is more challenging to convert residuals into human food because their residuals consist of wheat remnants. They are currently working with a university to create a recipe that uses these remnants, allowing the proteins to be utilized in the food sector. R2 states, “I think it is difficult to make new bread from old bread, but I think crackers and rusk can be made, which are more dry products with a large target group.” R6 recently heard about a bread pasta initiative which he is planning to look into.

Three obstacles are encountered for the conversion to human food. The first challenge involves allergens, as stated by respondents: “cross-contamination is a big problem for conversion” (R1), and “It is very difficult to divide the bread on allergens” (R4). A second issue arises from the fact that products made from residual flow are often more costly than those made from raw materials. As described by R1, “The customers from our circular sourdough bread are often enthusiastic about the product, but if I afterwards send the quotation, silence remains.” Moreover, this pricing dilemma extends beyond business clients, as end-consumers also exhibit hesitancy: “Because their consumers also pick a cheaper non-circular bread over a more expensive circular bread” (R1). Additionally, R3 mentioned a shortage of full-time equivalents (FTE) as another obstacle, obstructs the conversion of all residual waste into new products.

### Use in animal feed

Residual flow that cannot be used or converted into human food is often utilized for animal feed production. R1 aims to close the loop by purchasing eggs from chickens fed with their residual flow, which are then used to make cakes. As previously mentioned, R5 is attempting to convert their residual flow into human food, but for now, it is used for animal feed: “We have a machine which creates chunks for animals” (R5). R4 stated, “For 20 years now, we have worked with an animal feed company. I think it is good that the proteins in the product retain their value” (R4). Similar to his views on the other layers below avoiding food waste, R6 is sceptical about converting residual flow into animal feed. He argues that it is wasteful: “These bakers just throw their craftsmanship through the stomachs of cows. I think that is the largest value loss you can have” (R6)

### Use for sustainable energy

One layer that did not emerge from the statistical analysis but was mentioned by an interview respondent is the ‘use for sustainable energy.’ One company recently purchased a biodigester, a machine that creates gas from residual flow. “With this machine, we are able to provide our ovens with our own made gas, although not completely” (R4). This company is transitioning from using their residual bread for animal feed to sustainable energy production, which, according to Moerman's ladder, represents a degradation of circularity and thus sustainability.

Comparing the stakeholders for which companies have implemented CIP with the methods they use reveals a significant association ( $p < 0.01$ ). Prevention of food waste (layer 1, Moerman) is primarily motivated by clients and environmental concerns (Table 11). Non-stakeholder reasons include financial incentives and intrinsic motivation to do the right thing. Table 12 indicates that using residuals for human food is mostly driven by clients and environmental considerations. The third layer of Moerman's model is also mainly motivated by environmental concerns, along with other intrinsic motivations. The animal feed layer is motivated by societal and environmental concerns as well as financial purposes. Competitors, investors, employees, government, and suppliers are not mentioned. Overall, the most frequently mentioned stakeholders for implementing CIP are primary client stakeholder, and secondary, the environment as stakeholder.

Table 11: Crosstab 6

<b>Wat is de reden voor u om het voedsel op een circulaire manier te verwerken? * Zorgt u ervoor dat het aanbod aansluit op de vraag zodat er zo min mogelijk reststromen worden geproduceerd? Crosstabulation</b>				
Count		Zorgt u ervoor dat het aanbod aansluit op de vraag zodat er zo min mogelijk reststromen worden geproduceerd?		Total
		Ja	Nee	
Wat is de reden voor u om het voedsel op een circulaire manier te verwerken?	1	4	1	5
	De natuur	10	1	11
	Economisch	6	0	6
	Intrinsiek	4	0	4
	Maatschappij	2	0	2
	Voor de publieke sector (overheid)	3	0	3
	Voor klanten	13	1	14
<b>Total</b>		<b>42</b>	<b>3</b>	<b>45</b>

Table 12: Crosstab 7

**Wat is de reden voor u om het voedsel op een circulaire manier te verwerken? \* Verwerkt u reststromen van voedsel op een duurzame manier? Crosstabulation**

Count

	1	Verwerkt u reststromen van voedsel op een duurzame manier?				Total	
		Ja ik zorg er voor dat het op een andere plek nog kan worden opgegeten (zoals de voedselbank)	Ja, ik verwerk reststromen in voedsel wat door mensen gegeten kan worden	Ja, ik verwerk voedsel in diervoeding	Nee		
Wat is de reden voor u om het voedsel op een circulaire manier te verwerken?	1	5	1	1	0	3	10
De natuur		0	6	3	2	0	11
Economisch		0	2	2	2	0	6
Intrinsiek		0	0	3	1	0	4
Maatschappij		0	2	0	0	0	2
Voor de publieke sector (overheid)		0	2	0	1	0	3
Voor klanten		0	10	1	3	0	14
<b>Total</b>		<b>5</b>	<b>23</b>	<b>10</b>	<b>9</b>	<b>3</b>	<b>50</b>

### General information

Only 7% of respondents do nothing with their residual flow. According to the survey, this flow is either disposed or taken home by employees. The reason for not implementing CIP in their business is that it is too expensive to manage the residual flow. These respondents indicated that if there were pressure from the public sector or clients to implement CIP, they would change their current waste policy, highlighting the influence of stakeholder pressure.

Similar as for the reporting issue, small companies are finger pointing to the large companies to start changing. "I think the government should create a sort of fine system for large supermarkets that if they order too much bread they should pay a fine over the residual bread" (R2). However, also among the SME's there are conversations going about this problem: "together with colleague companies we started a group in which we share information about this subject" (R4).

A general problem with the adoption of CIP is that bakers are tunnel visioned entrepreneurs who are otherworldly (R6). They often miss the knowledge to keep the value of their craftsmanship made products (R6). Bakers are in general ultraconservative and not open to much innovation (R6). "I am convinced that only 33% of people working in the bread production sector is aware of what circularity is" (R1).

### SNM

Similar as in the previous chapter, SNM is looked at from the three niche-building processes of Geels et al. (2011).

### Articulation of Expectations and Visions

Articulation of expectations and visions involves defining clear and shared goals for the innovation, which helps to align the efforts of various stakeholders. In the context of CIP in bakeries, this is not present because CIP strategies are not structured and frequently present. On the contrary, the SMEs

do know that prevention of waste is most important as almost all companies have a prevention practice implemented within their organisation, so a shared vision is already created, however, not articulated.

### Network Building

Network building refers to the creation of networks involving diverse stakeholders who support the innovation. These networks are crucial for sharing knowledge, resources, and experiences. In the bakery industry, network building is seen through collaborations with organizations like Too Good To Go and partnerships with food banks. These networks enable bakeries to manage their residual flow effectively and support social causes, such as providing affordable bread to families with fewer financial resources. Additionally, discussions among SMEs about waste management and the establishment of groups to share information further illustrate network building.

### Learning Processes

Learning processes in SNM involve experimenting with and refining innovations based on feedback and experiences. This iterative process helps to overcome barriers and improve the innovation's fit with the social context. For example, bakeries face challenges in predicting sales due to weather variability and overproduction. Different prediction methods, such as tracking sales data or relying on gut feelings, illustrate that there is still a learning process to make as it comes to prediction strategies to minimize waste. These data-based learning processes are related to first-order learning (Schot & Geels, 2008). Additionally, experimenting with converting residuals into new products, like circular sourdough bread or sweet bread pudding, showcases how bakeries learn and innovate within their niche, which falls under second-order learning (Schot & Geels, 2008).

Together, this illustrates various aspects of SNM, including the motivations behind sustainable practices, the obstacles faced by niche innovations, the learning processes and incremental steps companies take, and the importance of networks and institutional support.

## 5.3 Influence SR on CIP

According to theory, the aim of SR is to create a more sustainable, transparent value chain. However, the this research shows contradicting results.

Firstly, the data indicates a notable difference between reporting and non-reporting companies in terms of food waste prevention. As shown in Table 13, 16% (2 out of 12) of companies that engage in reporting do not take measures to prevent food waste, compared to only 3% (1 out 33) of non-reporting companies, which is expected to be the other way around. This means that proportionally, less reporting companies are engaged in CIP than non-reporting companies.

Table 13: Crosstab 8

**Zorgt u ervoor dat het aanbod aansluit op de vraag zodat er zo min mogelijk reststromen worden geproduceerd? \* Rapporteert u over duurzaamheid? Crosstabulation**

Count		Rapporteert u over duurzaamheid?		Total
		Ja	Nee	
Zorgt u ervoor dat het aanbod aansluit op de vraag zodat er zo min mogelijk reststromen worden geproduceerd?	Ja	10	32	42
	Nee	2	1	3
Total		12	33	45

Secondly, the utilization of residual flows also varies between reporting and non-reporting companies. According to Table 14, 41% of reporting respondents use their residual flow for human food, 33% convert it into human food, and 25% convert it into animal feed. 0% of the reporting companies are not engaged in CIP. In contrast, non-reporting companies show different patterns, with 54% using residual flow for human food, 18% converting it into human food, and 18% converting it into animal feed. Proportionally, an analysis of the Moerman ladder indicates that non-reporting companies are managing their residual flows in a more circular manner compared to reporting companies. This finding is unexpected, especially considering the prevailing theory that reporting practices enhance corporate sustainability. However, 9% of non-reporting respondents have not implemented CIP practices at all compared to 0% of reporting companies, which shows that SR encourages companies to implement CIP within their businesses.

Table 14: SR and CIP

Sustainability reporting (SR)	Circular innovation practices (CIP)	
	Present	Absent
Present	Group A	Group B
	41% human food 33% conversion human food 25% animal feed	0% absence CIP
Absent	Group C	Group D
	54% human food 18% conversion human food 18% animal feed	9% absence CIP

All respondents who engage in reporting started doing so after implementing CIP practices, which means that potentially SR is influenced by CIP, and not the other way around. However, while assessing the motivation for SR, only 33.3% is attributing it to CIP and 66.66% to other reasons, which means that for only a small portion, SR and CIP are related to each other. None of the respondents have increased their CIP practices as a result of reporting, although they anticipate this might change in the future. R1 says: “it is cost-effective to engage in SR. Companies will be more aware of what they emit and produce, so they will eventually emit and produce less”, “I think the sector will implement more CIP if everybody has to report, but only under the condition if the whole sector is doing so” (R1). “What I think is that if people are confronted with these reports, people will become more conscious” (R3). “I am convinced that there is an association between reporting and CIP. Reporting creates more awareness and that can only have a positive effect” (R5).

### Scepticism and concerns

Despite the positive outlook of some respondents, there is also scepticism among respondents. Some doubt whether companies will truly achieve their stated goals, suggesting that reporting could become a mere checklist that companies and their legal advisors could navigate through, without making real changes. Concerns about greenwashing are also present, with respondents worried that some companies might manipulate reports to appear more sustainable than they are: “there are companies with a dot on the horizon on paper, but if they really reach that, I am not convinced.” (R1). “If reporting becomes some kind of checklist, than companies and their legal advisors are smart enough to read between the lines. Only if the consumers will be involved than the sector will implement more CIP I

think” (R3). “I hope the reports will not become greenwashing, but I am sure there will always be companies who read between the lines” (R5). Another significant concern is the control and verification of the reports. Respondents question how the government can ensure the accuracy of the reports and whether they reflect the actual practices of the companies: “That is also a large problem, how can the government check whether the reports say what is the actual truth?” (R3).

### Future of SR and CIP

As mentioned before, the CSRD will become a legal requirement for this sector. By assessing whether the sector knows about this, the results show that only 13.3% have heard of this requirement (figure 20).

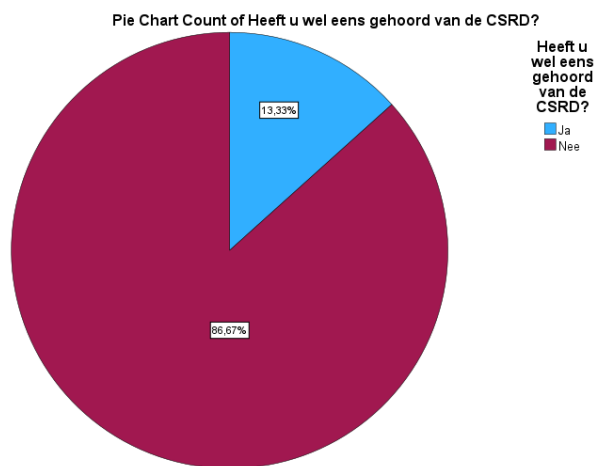


Figure 20: Pie Chart 7

The ones that do know generally exhibit a wait-and-see attitude towards reporting. They believe that reporting will start with larger companies and eventually impact SME ones, who may then need to provide information to the larger ones: “It starts somewhere in the top of the chain. It will come at us but I will ask their format if we have to report” (R1). “I think for large companies it is important to report, but for us it does not make sense. I am sure it will have an impact on the chain and that large companies eventually need information from us, but I hope they do not” (R4). There is hope that large companies will assist smaller ones in this process: “However, if they do, I hope they will help us to provide them with the information they need” (R4). While reporting becomes potentially more present in the sector, in general, the respondents are not convinced it will impact their current CIP business strategies. Some feel that their methods of managing residual flow are already precise and that reporting will not alter these established practices: “The manner we treat our residual flow is already very precise, I do not think reporting will change that” (R4). In fact, 64,4% of the respondents do not think that the sector will become more sustainable if SR becomes a legal requirement (CSRD) (figure 21).

Pie Chart Count of Denkt u dat de bakkerij sector van deze wettelijk verplichte rapportage duurzamer gaat worden?

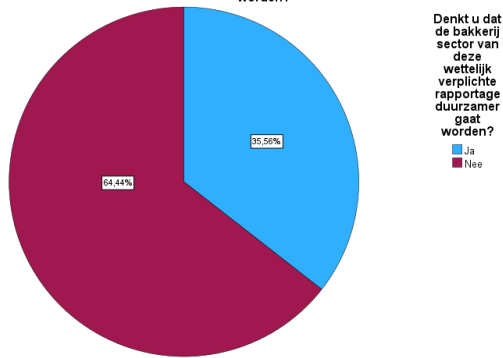


Figure 21: Pie chart 8

Moreover, 66,7% even think that it is not feasible to collect the information necessary for the reports (figure 22).

Pie Chart Count of Denkt u dat het haalbaar is voor uw bedrijf om deze informatie te verzamelen?

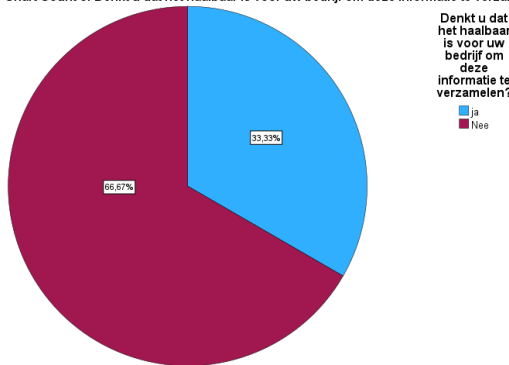


Figure 22: Pie Chart 9

The main reason for the feasibility concern is that it will take much time to collect all the information. To close off, the respondents think that the information about the environment will be the hardest information to collect, and information about governance will be the easiest information to collect (figure 23-24).

Pie Chart Count of Bij welk onderwerp verwacht u de meeste moeite krijgen met het verzamelen van informatie?

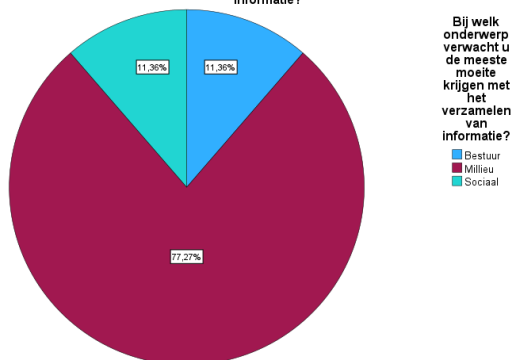


Figure 23: Pie Chart 10

Pie Chart Count of Welke informatie acht u makkelijk te verkrijgen?

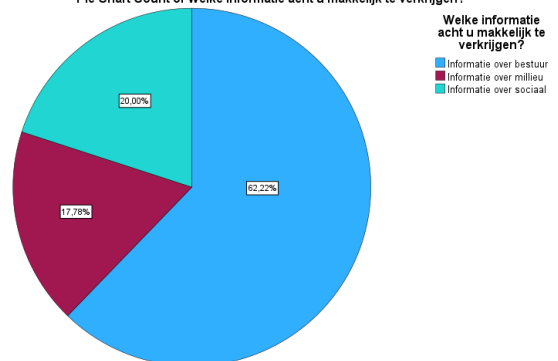


Figure 24: Pie chart 11

In summary, the results indicate that SR does not have a direct influence on CIP, contradicting existing literature. Additionally, non-reporting companies exhibit more circular residual waste treatment, according to the Moerman ladder, than reporting companies, which is also unexpected. Interviewees believe this trend will change in the future, anticipating that companies will implement more CIP if SR becomes mandatory. However, the majority of survey respondents disagree, with greenwashing and government oversight as main concerns. The feasibility of mandatory SR is also a concern for SMEs.

## 6. Conclusions and recommendations

This chapter reveals the conclusions from each sub-question and the overall conclusion which is the answer on the main-question of this research.

### 6.1 Role of SR in management

Sustainability reporting is not a widespread practice within the bread production sector. Only a small portion of companies have integrated reporting strategies into their business plans. Analysis indicates that company size does not significantly influence the decision to engage in reporting, suggesting other factors are at play.

#### Role in management

Among the companies that do report, the majority does so informally, with a smaller portion engaging in formal reporting practices. Formal reporting is more common among medium-sized companies, compared to micro and small companies, and typically appears in annual accounting reports, with some companies adhering to established standards. There is no significant link between company size and the method of formal reporting.

The reason why sustainability reporting is adopted by organisations in management is predominantly because of stakeholders, which was expected by the SNM theory (Smith & Raven, 2012). Micro companies focus on clients and competitors, small companies on the public sector and employees, and medium companies on clients, employees, the public sector, and shareholders. No significant correlation was found between company size and the stakeholders targeted by formal reports, which means that all stakeholder mentioned above could be a motivation for reporting for all sorts of SMEs. So, there is no clear stakeholder that is pointed out to be the reason to take up formal sustainability reporting in management. On the contrary, stakeholders that are not mentioned to be important are suppliers, investors and the environment.

The primary goals of formal reporting include enhancing transparency and providing quantitative benchmarks, which help reduce the risk of greenwashing, which is related to first order-learning (Schot & Geels, 2008). Despite these benefits, SMEs often view the advantages as more relevant to larger firms and express concerns about the authenticity and impact of reports for their current business.

Informal reporting is slightly more prevalent than formal reporting in management, with companies using methods such as social media, websites, and newsletters to reach clients, employees, and suppliers. Challenges such as time constraints and doubts about transparency and comparability are common. Middle-sized companies, in particular, question the integrity of informal reporting, while smaller firms struggle with the time commitment required.

No significant association was found between company size and the channels used for informal reporting, which means that every channel mentioned above is used by all types of SMEs in the sector. Stakeholder motivations for informal reporting vary, with micro companies focusing on clients and suppliers, small companies on clients and employees, and medium companies on investors, clients, and employees.

According to theory, a way to measure how reporting is integrated in management is by adoption, extent and quality (Carmo & Miguéls, 2022). As can be read before the adoption of sustainability reporting by SMEs is mostly done because of stakeholders. The extent, also known as frequency of reporting (Carmo & Miguéls, 2022), varies significantly across different stakeholders, highlighting the influence of stakeholder accessibility and involvement within the company. The unexpected frequency

of reporting to certain stakeholders, like suppliers, suggests complex and unstructured reporting behaviour. This variation underscores the nuanced interplay and diversity of stakeholder relationships and the factors that drive reporting practices. The quality of the information in the reports is a concern in this sector because of the frequent informal basis of the reporting which is not verifiable. This even expressed by the SMEs within the sector. The content of both formal and informal reports typically includes information on sustainable innovations, energy use, material usage, and, to a lesser extent, CO2 emissions, water use, and biodiversity impact. Social values reported include treatment of employees, inclusivity, diversity, and transparency. Governmental values, such as decision-making transparency and company strategy, are mentioned in about half of the reports. However, some of these aspects are not mentioned at all in the reports, which harms the quality of the data (Hahn & Kühnen, 2013).

### **Non-implementation in management**

However, there are also many reasons for SMEs to not implement sustainability reporting in management. SMEs often lack the resources, knowledge, and motivation required for comprehensive reporting, which is related to adoption (Carmo & Miguéls, 2022). Many SMEs expect larger companies to lead the way and provide reporting formats and guidance. Larger companies acknowledge this responsibility and often require external assistance to establish their reporting practices, themselves. However, they are eager to share their knowledge with smaller SMEs to create a reporting supply chain with more transparent information, which accelerates network building according to SNM (Schot & Geels, 2008).

Motivation and ability are significant factors affecting the decision to report. Many companies do not perceive added value in formal reporting unless legally required. The upcoming Corporate Sustainability Reporting Directive (CSRD) is expected to increase pressure on companies to adopt formal reporting practices. Respondents anticipate a gradual transition towards mandatory reporting, driven by larger companies and stakeholder demands. So by the coming of the CSRD, reporting make take a more central place in management practices of SMEs.

In conclusion, although reporting is not yet a common practice in management of SMEs in the bread production sector, the evolving regulatory landscape and stakeholder pressures are likely to drive greater adoption. Reporting touches upon all three aspects of the SNM theory because by reporting, expectations and visions are communicated, however, not yet accelerated within this sector. Acceleration may occur by more structural reporting practices which is shared among a large group of actors. A shared articulation of expectations and visions will help SMEs to have a clearer picture on to what they have to report which enables more niches to occur (Schot & Geels, 2008). By communicating this expectations and visions, networks are build more easy because relevant stakeholders know what the SMEs do about circular innovation practices. If they see potential in these innovations it is more likely for them to collaborate. Learning about the niches is currently present by de informal way of reporting because some stakeholders are made aware of the niches that are implemented by SMEs. So, currently reporting does not have a large role in management of SMEs, however, there is much potential.

## **6.2 Current situation CIP**

The implementation of CIP among companies in the food production sector is driven by various motivations, primarily environmental concerns and client demands. Despite these efforts, the effectiveness and extent of CIP adoption vary widely, influenced by economic considerations, intrinsic motivations, and practical challenges specific to different segments of the industry.

## Motivations for CIP Implementation

Companies are motivated to implement CIP for several reasons, including environmental sustainability, economic benefits, and client expectations. Many businesses have integrated the first step of the ladder of Moerman focusing on reducing overproduction through strategies such as sales monitoring, producing on demand, and minimizing stock. This approach not only addresses environmental concerns (Lehmann et al., 2022), but also has significant financial incentives by reducing waste and improving profit margins.

Intrinsic motivations also play a critical role. Many respondents express a genuine commitment to sustainability, driven by a desire to preserve the value of their products and to operate in an environmentally responsible manner. Additionally, some companies aim to serve societal needs by redistributing food to those in need or using residuals in animal feed, thus ensuring, in their opinion, that the entire product lifecycle is utilized effectively.

Some niches implemented are currently socio-technical niches, while others have already evolved into market niches (Susur & Engwall, 2023). The niches associated with the first layer of the Ladder of Moerman are widely adopted by most SMEs, effectively replacing previous systems where overproduced bread was discarded. In contrast, newer ideas focused on converting residual bread into human food remain exceptional and have not yet become market niches. These niches still need to demonstrate their potential to replace existing systems by either integrating smoothly with the current system or by fundamentally changing the rules of the game and becoming the new standard (Susur & Engwall, 2023).

## Barriers for niches to occur

The study highlights that while most companies have embraced the layers of Moerman for CIP, the adoption of these practices is not without barriers. Companies face significant obstacles in these areas, ranging from prediction inaccuracies and the challenges of night baking to the economic and logistical difficulties of producing and marketing circular products.

For instance, the unpredictability of demand due to factors like weather conditions complicates efforts to reduce overproduction. The inherent conservatism in the baking industry, coupled with a deeply ingrained preference for fresh daily products, further complicates efforts to shift towards more sustainable practices.

Additionally, converting residuals into human food products encounters hurdles such as allergen management, higher costs of circular products, and limited workforce availability. Despite these challenges, some companies have successfully innovated by developing new products from residuals, highlighting the potential for broader adoption with the right support and incentives.

## Stakeholder influence

Stakeholder influence is pivotal in driving CIP implementation. Clients are a major motivator for companies to adopt sustainable practices, often dictating the terms of production and waste management. However, the study also reveals that the broader industry context, including competitors, investors, and government, plays a lesser role in influencing CIP adoption.

The role of large companies and regulatory frameworks is crucial. There is a call for more strict regulations and incentives to promote CIP, especially among smaller companies that look to larger entities for leadership and support, such as with the SR matter. The idea of penalties for overproduction

and wasted products is suggested as a potential measure to enforce more sustainable practices across the industry.

The implementation of niches in the bakery industry, particularly through circular innovation practices, showcases a multifaceted approach to innovation and environmental responsibility. This study highlights three critical components in this process: articulation of expectations and visions, network building, and learning processes (Schot & Geels, 2008).

### **Articulation of Expectations and Visions**

Articulating clear expectations and visions is essential for aligning the efforts of diverse stakeholders towards common sustainability goals (Schot & Geels, 2008). In the context of CIP, most bakeries have embraced the initial step of avoiding food waste, motivated by both economic benefits and intrinsic values. By clearly defining the vision of minimizing waste, these bakeries not only enhance their operational efficiency but also contribute to broader environmental sustainability objectives. This alignment of strategies towards waste reduction underscores the importance of having a shared vision that resonates with both economic and ecological motivations. However, this vision or expectations are not yet developed because there are many different reasons why SMEs have implemented different sorts of CIP, and they are not aware of what the most sustainable options are for them to reduce waste or use their waste in another form.

### **Network Building**

Effective network building plays a crucial role in the successful implementation and acceleration of niches (Smith & Raven, 2012). In the bakery industry, the creation of networks involving a variety of stakeholders, such as collaborations with organizations like Too Good To Go and partnerships with food banks, demonstrates the value of shared knowledge and resources, and is currently in place. Another example is a network with different companies to create circular bread. These networks are instrumental in managing residual flows and addressing social issues, such as providing affordable bread to economically disadvantaged families. Furthermore, the establishment of discussion groups among SMEs to share waste management practices exemplifies how network building fosters a collaborative environment that support niches to occur.

### **Learning Processes**

The iterative nature of learning processes is vital for refining and improving CIP initiatives. Bakeries encounter numerous challenges, such as predicting sales affected by weather variability and managing overproduction. The ongoing experimentation with different prediction methods, ranging from sales data analysis to intuitive approaches, highlights the continuous learning required to optimize waste reduction strategies. This iterative learning process corresponds to first-order learning (Schot & Geels, 2008), where incremental improvements are made based on feedback and experiences. Additionally, the development of new products from residuals, like circular sourdough bread and sweet bread pudding, represents second-order learning, where more profound innovations emerge from experimental practices. These learning processes illustrate how bakeries adapt and evolve within their niche to achieve greater sustainability.

In conclusion, the successful implementation of CIP in bakeries is underpinned by the articulation of clear visions, robust network building, and continuous learning processes. Currently, there are many CIP adopted, but without a clear strategy. By aligning economic and environmental goals, fostering collaborative networks, and engaging in iterative learning, bakeries can effectively manage waste and

contribute to broader sustainability efforts. In this way, socio-technical niches can become market-niches which eventually can change the current regime.

### 6.3 Role of sustainability reporting in management of circular innovation practices

In contradiction with the theory, this research shows that currently, SR alone does not necessarily lead to better circular niche management among SMEs in the Dutch bread production sector, however, according to the strategic niche management theory, the role in niche management is present and has much potential.

Reporting companies tend to have a diversified approach to residual flow utilization, engaging in various forms of conversion for human food and animal feed. Non-reporting companies are slightly more inclined to use these flows directly for human food. This suggests that reporting might influence the adoption of more complex residual flow management strategies, like conversion of the residual flow into human food or animal feed. However, these two layers are lower on the ladder of Moerman. Which means that companies are busy with doing something with their flow, however, passing the second layer of the ladder which is more circular. A little portion of the non-reporting companies have not implemented any CIP practices at all, compared to non for the reporting companies. This shows that reporting companies are always doing something with their residual flows. This show that reporting might influence the uptake of CIP.

#### Relationship between sustainability reporting and CIP

Companies that engage in reporting do so after implementing CIP practices, with motivations for reporting varying between CIP-related and other reasons. However, reporting particularly, has not yet led to increased CIP practices among these companies. Respondents express mixed views on the relationship between reporting and CIP, with some anticipating that increased awareness from reporting will lead to improved practices, while others are concerned about the potential for superficial compliance and greenwashing. The manipulation of reports to present a falsely positive image of sustainability are significant worries. Another concern is control and verification of the reports. Respondents question the ability of the government to ensure the accuracy and truthfulness of reports, highlighting the potential for discrepancies between reported and actual practices. Another concern is a wait-and-see attitude towards SR, but also for CIP. They believe that the momentum for reporting will come from larger companies and eventually impact SMEs, who may then need to provide information to their larger counterparts. There is hope that larger companies will assist smaller ones in this process, but there is also apprehension about the practicality and relevance of reporting for smaller enterprises. For CIP, respondents believe that the impact should start at the large companies as well. They believe that if they adjust their processes, SMEs will also be encouraged to implement more CIP, because large companies have more influence on SMEs than SMEs have on large companies.

Some respondents believe that implementing reporting in management will not significantly change their current practices in managing residual flows. They feel that their methods are already precise and that reporting will not alter these established practices. The majority of the sector is not convinced that the sector will become more sustainable while adopting more SR practices. However, some respondents also see the advantages and do think the sector will become more sustainable, such as literature suggests (Opferkuch et al., 2021).

On a more positive note, by looking at it through the lens of the SNM theory, role of sustainability reporting in management of niches in the bakery sector, particularly in the context of circular innovation practices (CIP), becomes more clear. SR can significantly influence the development and

implementation of circular innovations by articulating expectations and visions, fostering network building, and enhancing learning processes (Schot & Geels, 2008).

### **Articulation of Expectations and Visions**

Sustainability reporting plays a role in articulating clear expectations and visions within the bakery industry. By providing a structured platform for companies to communicate their sustainability goals and practices, SR helps align the efforts of various stakeholders. This alignment is essential for promoting circular innovations, as it sets a shared vision for reducing waste and enhancing environmental sustainability (Hoogma et al., 2005). Although currently not widespread, the adoption of SR by more SMEs could streamline the articulation of such visions, making it easier for bakeries to identify and pursue the most effective CIP strategies.

### **Network Building**

Effective network building is central to the success of circular innovations. SR facilitates the creation of networks by providing transparency and sharing information about sustainability practices. This transparency helps to inform stakeholders, including clients, employees, suppliers, and public authorities. By detailing their CIP efforts in reports, bakeries can attract partners and collaborators who share similar sustainability goals. This collaborative environment accelerates the implementation of CIP by pooling resources, knowledge, and expertise. For instance, partnerships with organizations like Too Good To Go and food banks exemplify how network building can enhance residual flow management and support social causes. However, currently this is limited happening.

### **Learning Processes**

Sustainability reporting fosters both first-order and second-order learning processes within the bakery sector (Geels, 2012). First-order learning involves incremental improvements based on feedback and experiences, while second-order learning leads to more profound innovations that can transform existing systems (Geels, 2012). Through SR, bakeries document their challenges, strategies, and outcomes related to CIP, creating a valuable knowledge base. This documentation helps SMEs learn from each other's experiences and refine their practices. For example, by reporting on various methods to predict sales and manage overproduction, bakeries can share insights and develop more effective waste reduction strategies. Similarly, innovations like converting residuals into new products can be more widely adopted when their development and success are transparently reported. However, just as with articulation of visions and expectations and network building, this is currently because reporting is slightly present in this sector.

## **6.4 Overall conclusion**

Sustainability reporting (SR) is gradually becoming a critical aspect of business operations in various industries, including the bread production sector. This analysis aims to understand the role of SR in managing circular innovation practices (CIP) within the Dutch bread production sector and is answering the main question: **“What is the role of sustainability reporting in the management of circular innovation practices in the Dutch bread production sector?”** highlighting its current status, challenges, and potential benefits.

Sustainability reporting is not yet a widespread practice in the Dutch bread production sector. Only a small portion of companies have integrated SR into their business plans. Among the companies that do report, the majority engage in informal reporting practices, with a smaller portion adopting formal

reporting. Formal reporting is more prevalent among medium-sized companies and typically appears in annual accounting reports, sometimes adhering to established standards.

### **Role in Management**

The primary motivation for adopting sustainability reporting among companies is stakeholder influence. However a particular stakeholder can not be pointed out as most important. Different SMEs have implemented sustainability reporting in management for different types of stakeholders.

The main goals of formal reporting include enhancing transparency and providing quantitative benchmarks, which help reduce the risk of greenwashing. This aligns with first-order learning, where incremental improvements are made based on feedback and experiences. Despite these benefits, SMEs often perceive the advantages of formal reporting as more relevant to larger firms and express concerns about the authenticity and impact of such reports on their current business practices.

Informal reporting is slightly more prevalent than formal reporting, with companies using social media, websites, and newsletters to communicate with clients, employees, and suppliers. However, time constraints and doubts about transparency and comparability present significant challenges.

The extent and quality of sustainability reporting vary significantly across different stakeholders, highlighting complex and unstructured reporting behaviours. The content of both formal and informal reports typically includes information on sustainable innovations, energy use, material usage, and, to a lesser extent, CO2 emissions, water use, and biodiversity impact.

Several barriers hinder the adoption of sustainability reporting among SMEs, including lack of resources, knowledge, and motivation. Many SMEs expect larger companies to lead the way and provide reporting formats and guidance. The upcoming Corporate Sustainability Reporting Directive (CSRD) is anticipated to increase pressure on companies to adopt formal reporting practices, potentially driving greater adoption across the sector.

### **Role in niche management**

The niches that are present within this sector can be placed in in the layers of the ladder of Moerman (Lehmann et al., 2022). Despite that the SMEs are limited aware of this ladder, they all have implemented some practices which can be related to circular innovation.

The role of sustainability reporting in the creation of these niches is again explained in the light of the three aspects of strategic niche management; articulation of experiences and visions, network building and learning (Shot & Geels, 2008). Although, reporting is not widespread implemented, it has great potential.

Sustainability reporting plays a role in articulating clear expectations and visions within the bakery industry. By providing a structured platform for companies to communicate their sustainability goals and practices, SR helps align the efforts of various stakeholders. This alignment is essential for promoting circular innovations, as it sets a shared vision for reducing waste and enhancing environmental sustainability.

Effective network building is central to the success of circular innovations. SR facilitates the creation of networks by providing transparency and sharing information about sustainability practices. This transparency helps inform stakeholders, including clients, employees, suppliers, and public authorities. By detailing their CIP efforts in reports, bakeries can attract partners and collaborators who share

similar sustainability goals. This collaborative environment accelerates the implementation of CIP by pooling resources, knowledge, and expertise.

Sustainability reporting fosters both first-order and second-order learning processes within the bakery sector. Through SR, bakeries document their strategies, and outcomes related to CIP, creating a valuable knowledge base. This documentation helps SMEs learn from each other's experiences and refine their practices. By reporting on various methods to predict sales and manage overproduction, bakeries can share insights and develop more effective waste reduction strategies. Similarly, innovations like converting residuals into new products can be more widely adopted when their development and success are transparently reported.

### **Conclusion**

While sustainability reporting is not yet a common practice in the Dutch bread production sector, the evolving regulatory landscape and stakeholder pressures are likely to drive greater adoption. SR can play a significant role in articulating expectations and visions, fostering network building, and enhancing learning processes, all of which are crucial for the management of circular innovation practices. Future efforts should focus on providing the necessary resources and support to SMEs to facilitate this transition, ensuring that SR becomes a standard practice across the industry and strengthens strategic niche management.

## 6.5 Recommendations

This chapter is divided in three sub-parts. The first part is about recommendations for the Dutch bread production sector, the second for policy makers and the last part are recommendations for the SMEs themselves.

### Sector

#### 1. Increase Awareness Reporting

The sector should prioritize enhancing awareness regarding the importance of sustainability reporting, to create a more transparent bread production sector where knowledge sharing and network building is enabled. By this, shared visions could be developed and niches can break through current systems more easily. Regular campaigns, workshops, and seminars should be organized by the business organisations to educate all SMEs about the benefits and necessity of transparent reporting practices. Such initiatives will foster the quality of shared information by the SMEs and makes compliance with the coming directive (CSRD) easier.

#### 2. Top-Down Knowledge Sharing

To ensure effective dissemination of information and best practices, it is crucial to establish robust channels for knowledge sharing from top to bottom. Results show that the SMEs are heavily relying on the larger players in the supply chain. These players should take the lead and help SMEs with their reporting formats and strategies. Larger companies possess greater leverage over SMEs, enabling them to exert more pressure to implement CIP practices.

#### 3. Information sharing

All players in the sector should actively communicate strategies, successful case studies, and innovations related to food loss prevention and recovering and reporting. This approach will create a cohesive understanding and implementation of practices across all levels of the sector. By this networks can be easily build because companies which share similar sustainability goals can collaborate.

#### 4. Implement the Ladder of Moerman

The sector should adopt the Ladder of Moerman, a hierarchical approach to food waste prevention sector wide. When this ladder is known by all layers in the sector, comparing companies is more transparent and companies become aware what is best to do with their food waste. Therefore, the sector becomes more sustainable with less bread to waste.

#### 5. Reconsider current working methods

According to the results, the sector is currently built on overproduction. A reconsideration should be made on the way of working and the portions that are sold in the shops. By shifting from night to day baking, a smaller product range and smaller portions prevents food waste.

### Policy Makers

#### 1. Create urgency and assistance

This research indicates that SMEs in the sector often do not recognize the urgency of reporting. Policymakers should clarify the importance of reporting to improve compliance rates and reduce the perception of reporting as a pointless activity. Additionally, SMEs frequently lack the capacity to independently implement comprehensive reporting and waste reduction strategies. Government

grants, subsidies, and dedicated support programs can empower SMEs to align with industry and regulatory standards.

## 2. **Develop clear guidelines**

To facilitate consistent and effective reporting across the sector, policymakers must establish clear and standardized guidelines for SR. These guidelines should detail the required metrics, reporting frequency, and compliance expectations, ensuring that all entities understand their obligations.

## 3. **Standardize reporting formats**

Creating a standardized reporting format will streamline the reporting process and make it easier for businesses to comply with regulations. This format should be user-friendly and adaptable to different sizes and types of businesses, allowing for accurate and efficient data collection and analysis.

### **SMEs**

#### 1. **Implement structural reporting**

SMEs should integrate sustainability reporting into their regular business operations. This involves establishing internal processes and assigning responsibilities for data collection, analysis, and reporting. Structural reporting ensures that food waste management becomes a continuous and systematic part of business activities. This eventually leads to more circular innovation practices.

#### 2. **Apply the Ladder of Moerman for Food Prevention**

SMEs should adopt the Ladder of Moerman to guide their food waste reduction efforts. By focusing on prevention first, they can minimize waste at the source. Subsequent steps should involve re-purposing surplus food for human consumption and converting waste to human and animal feed. This hierarchical approach maximizes resource efficiency and minimizes environmental impact.

#### 3. **Share information**

SMEs should actively participate in information sharing within the sector. By collaborating with other businesses, industry associations, and research institutions, they can gain insights into best practices, innovative solutions, and successful case studies. Regular information exchange fosters a collective effort towards reducing food waste and enhances the overall effectiveness of individual strategies for both reporting and circular innovation practices

## 7. Discussion

The discussion chapter reveals the contributions of my research to the field of sustainability reporting and circular innovation practices and the role in management of reporting is these practices. the relation with previous knowledge and directions for further research.

### 7.1 Contribution of the study

As mentioned in the introduction chapter, the cause for this research is the new directive CSRD. The aim of this directive is to make supply chains more transparent, and eventually more sustainable (Directive 2022/2464). Much research into SR and the CE is done, but the two concepts are always treated separately and are often done for large companies (>250 employees), because they were already legally required to report. However, whether SR actually plays a role in the development of niches such as CIP is under researched, especially in the Dutch bread production chain. Therefore, the idea of this research appeared, and the Dutch bread production sector seemed to be an applicable research field because bread is the number one wasted food within the Netherlands (Lieshout & Knüppe, 2023). Because the adoption of the CSRD is driven by secondary stakeholder government, I was curious, which other stakeholders may also play a role to adopt SR and CIP. This curiosity came from the SNM theory which underscores the importance of stakeholders in the development of niches. Beforehand, I knew that SR and CIP would be in its infancy in the sector I decided to utilize the SNM theory to see whether niches in the sector can emerge to foster the transition towards a more reporting regime with an increasing amount of CIP.

In the literature I found that there are many guidelines for companies which helps them with SR (Dragu & Tiron-Tudor, 2013), and for large companies it is conceptualized as the basis for a firms' strategy (KPMG, 2017). However, literature showed that this does not apply to SMEs (Gutiérrez et al., 2021). For them, to reporting within their management practices is quite difficult. A main reason for this is that there is no regulatory requirement to do so. In general, a sustainability report entails a decision-making process lead by rules and procedures. However, literature showed that SMEs lack the ability and resources to do so, and the frameworks used by large companies are more confusing than helping (Arena & Azzone, 2012). Therefore, a pre-assumption was made that also in the Dutch bread production sector, companies did not have much formal reports in which CIP are described and the effect of these niches could be measured. Therefore, the decision was made to broaden the definition of SR, and also include informal written communication. The following definition of SR was developed: "SR is all sorts of written communication which is distributed through every conceivable channel". Because of the literature review, I was in the assumption that SR would have an effect on the adoption of CIP.

In the methodology chapter I explained that I was not only using a survey but also aimed for deeper insights through interviews, necessary because of the disappointing response rate of the survey. Because of the low reporting rate of the respondents, some crucial questions were only filled out by 20% of the total respondents which made writing the results more difficult.

In line with literature, the results show that SR can play a significant role in the management of circular innovation niches, however, the sector is not aware. For this sector, SR is minimally implemented, but has much potential. Currently, CIP is more widely adopted than SR, but to create market-niches from socio-technical niches is still challenging. One reason is that for this sector it is apparently not necessary to communicate their current CIP practices, which makes articulation of vision and expectations, network-building and learning a difficult tasks, which is according to the SNM theory crucial for the development of niches. Also, the respondents are very sceptical when it comes to the future legal

requirement to report because they are not aware, they think collecting the data is not feasible and they are not convinced that SR leads to more CIP within the sector.

This research contributes to science by addressing what role SR has in the development CIP because this is under investigated. The research is also specified to SMEs which are often excluded from SR research. The adoption of SNM theory, was utilized to investigate what is necessary for to foster transition toward a more sustainable sector. The research also discovered what the current status in the sector is of SR and CIP.

This research contributes to society because the findings provide valuable insights for policymakers on the current state and challenges of SR and CIP for SMEs, which can inform the development of more effective and supportive regulations, so that SR can have a more central role in management of niches to eventually create a more sustainable sector. SNM theory show barriers for niches to occur and become mainstream. These barriers are recognized now and can be tackled more easy. The second societal contribution is the industry awareness and barriers of SR and CIP. This encourages more informed and strategic approaches toward these two phenomena. The last contribution is for SMEs, because this research shows ideas of SR and CIP which they can utilize. Therefore, the sector can learn from itself which enables more partnerships and simultaneously niches to occur.

The limitations of the contribution can be found in the next sub-chapter

## 7.2 Limitations of the study

While the study provides valuable insights into SR, CIP and the role of SR in the development of CIP, this study is not executed without any limitations.

The first limitation is the sample size and representativeness. The aimed 5% population size of the survey was not reached within this study. Therefore, the sample of SMEs might not adequately capture the diversity of the industry, which limitations the generalizability of the findings. Moreover, not all sections of the survey had to be filled out by every respondent which makes the respondent rate on some crucial questions very low. This problem was beforehand tackled up by in-depth interviews. However, many companies were not open to an interview which resulted in underrepresentation of the non-SR, non-CIP group and SR, non-CIP group, which made robustness and interpretation of the results difficult. Furthermore, not all actors in the sector are assessed, industrial bakeries were not open to an interview, which makes the results only applicable for arsenal bakeries and mill companies.

The low response rate of the survey and interviews could be due to non-response bias (Sedgwick, 2014). This means that respondents were potentially not willing to fill out the survey or participate in an interview because they potentially do not want to share what they do about SR and CIP, potentially harming their business (Sedgwick, 2014).

Than, this study has only focussed on the reporting segment of management, which falls under communication of a company, however, there are many more aspects that need to be fulfilled if sustainable. According to Caniëls and Romijn (2008), technical management, project management and senior management are also important to support the creation of niches. It could be that those aspects are present in de sector which resulted in the uptake of circular innovation practices.

Another limitation is the reliance on self-reported data. The data collected relies on self-reported information from respondents, which may be subject to bias (Lance & Vandenberg, 2015). Participants may have not answered according to their actual practices or may have left blanks at questions they

did not want to answer. The chance that respondents answered socially desirable answers is present. This impacts the validity of the research.

Additionally, the research was constrained by a limited time frame, which hindered the researcher's ability to conduct a thorough investigation. Given more time, it would have been possible to conduct more extensive interviews, potentially yielding more precise information.

### 7.3 Further research

This study was unable to establish a clear connection between SR and CIP. Several factors could explain this. Firstly, the limitations of this research resulted in a low response rate, making it difficult to draw definitive conclusions. This was primarily due to the current lack of mandatory reporting for SMEs.

Research conducted after 2029, when the government will have monitored the Corporate Sustainability Reporting Directive (CSRD) requirements, could potentially provide a clearer picture of whether the sector has actually implemented more CIP as a result of SR, and if socio-technical niches have become market niches. There could in addition be measured if the three aspects of the SNM theory; articulation of vision and expectations, network-building and learning has accelerated. The importance of stakeholders and emergence of niche innovations will also be more present at that time. This current study could then serve as a baseline for such future research. A longitudinal study could be valuable in measuring differences over time, providing insights into the long-term effects of sustainability reporting on CIP.

Furthermore, this study relies on self-reported data, which introduces some limitations in terms of reliability. A follow-up study incorporating third-party audits could enhance the reliability of the data and provide a more accurate assessment of the relationship between SR and CIP.

Lastly, conducting this research in other sectors could reveal similarities and differences, allowing for cross-sector learning. By sharing insights, these sectors can develop more transparent and circular business practices on a multidisciplinary scale.

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## 9. Appendices

### A. Codebook

Code	Code Group 1	Code Group 2	Code Group 3	Code Group 4	Code Group 5	Code Group 6
accelerate CIP				SNM		
accelerate formal reporting				SNM		
accelerate SR				SNM		
advantage formal reporting			Reporting general			
chain influence				SNM		
channel formal reporting			Reporting general			
channel informal reporting			Reporting general			
CIP	CIP general					
CIP concurents					Stakeholder theory	
CIP pressure	CIP general					
content formal reporting			Reporting general			
content informal reporting			Reporting general			
conversion to human food		Ladder Moerman				
disadvantage SR			Reporting general			
disadvantage CIP						
feasibility reporting			Reporting general			
formal reporting government					Stakeholder theory	
formal reporting						Structural coding
formal reporting competitors					Stakeholder theory	
formal reporting stakeholders					Stakeholder theory	
future formal reporting			Reporting general			
future informal reporting			Reporting general			
General information						Structural coding
Help SR				SNM		
Importance sustainability						
Influence SR > CIP						
informal reporting suppliers					Stakeholder theory	
informal reporting						Structural coding
informal reporting customers					Stakeholder theory	
informal reporting employee					Stakeholder theory	
informal reporting suppliers					Stakeholder theory	
Knowledge CIP	CIP general					
knowledge employees	CIP general					
Motivation CIP	CIP general					
Motivation CIP customers					Stakeholder theory	
Motivation CIP investors					Stakeholder theory	
motivation formal reporting shareholders					Stakeholder theory	
motivation formal reporting					Stakeholder theory	
motivation formal reporting customers					Stakeholder theory	
motivation informal reporting					Stakeholder theory	
motivation informal reporting customers					Stakeholder theory	
motivation prevention		Ladder Moerman				
motivation SR					Stakeholder theory	
motivation sustainability					Stakeholder theory	
obstacle CIP	CIP general					
obstacle formal reporting			Reporting general			
obstacle informal reporting			Reporting general			
obstacle SR			Reporting general			
partnerships				SNM		
Prediction		Ladder Moerman				
Prevention		Ladder Moerman				
reccomendation						Structural coding
residual flow		Ladder Moerman				
SQ1						Structural coding
SQ2						Structural coding
SQ3						Structural coding
SR pressure					Stakeholder theory	
Sustainability other						Structural coding
use for human food		Ladder Moerman				
Use for sustainable energy		Ladder Moerman				
use in animal feed		Ladder Moerman				

## B. Example interview guide

### Interviewschema

#### *Wel rapporteren, wel circulair verwerken reststromen*

#### Opening statement:

- Emma Zwartjens
- 23
- Radboud University – corporate sustainability
- Bakkersgrondstof
- Aanleiding
- Consent
- Wijze van dataverwerking

**Definitie SR:** "alle soorten geschreven communicatie die is verspreid via elk denkbaar kanaal".

**Definitie CIP:** "het toepassen en verwerken van reststromen in voeding voor mens en dier".

#### Onderwerp 1: Algemene informatie

**Vraag 1:** Hoe lang zit u al in het bakkersvak?

- a. Waarom bent u bakker geworden?
- b. Hoe ziet u duurzaamheid binnen het bakkersvak?
- c. Hoe belangrijk vindt u duurzaamheid?

**Vraag 2:** Wat zijn de belangrijkste duurzaamheidsdoelstellingen binnen uw bakkerij?

**Vraag 3:** Hoe integreert de bakkerij duurzaamheidspraktijken in dagelijkse activiteiten?

#### Onderwerp 2: Duurzaamheidsrapportage - formeel

**Vraag 1:** Wat is de reden dat u dit niet doet?

- a. Voelt u niet de druk om het te doen van buiten?
- b. Ziet u kansen in formeel rapporteren?

**Vraag 2:** Weet u welke raamwerken beschikbaar zijn om wel te rapporteren?

#### Onderwerp 3: Duurzaamheidsrapportage - informeel

**Vraag 1:** Via wat voor kanalen rapporteert u informeel?

- a. Waarom deze kanalen?

**Vraag 2:** Wat is uw doel van het informeel rapporteren over duurzaamheid en wat bereikt u ermee?

- a. Wat voor soort informatie deelt u via de informele manier?
- b. Op welke manier verkrijgt u de informatie welke u verwerkt in informele rapportages?

**Vraag 3:** Zijn er uitdagingen die u merkt binnen het informeel rapporteren?

- a. Waarom is dat zo?
- b. Welke vindt u belangrijker?

**Vraag 4:** U geeft aan dat u voor klanten informeel rapporteert. Waarom is deze stakeholder zo belangrijk?

- a. Zijn er nog meer stakeholders belangrijk?

**Vraag 5:** Hoe ziet u de toekomst van formeel en informeel rapporteren?

- a. Gaat het belangrijker worden?
- b. Gaan meer stakeholders het belangrijk vinden?

#### **Onderwerp 4: Voedselverspilling – preventie**

**Vraag 1:** u geeft aan voedselverspilling tegen te gaan door preventie door voorraadverlaging.

- a. Hoeveel KG aan reststomen scheelt dit denkt u?
- b. Op welke manier wordt dit gemeten en gemonitord?
- c. Wanneer bent u daarmee begonnen?
- d. Zou u meer kunnen/willen doen aan preventiemaatregelen?
  - a. Hoe dan?
  - b. Wat houdt u tegen?

#### **Onderwerp 5: circulair verwerken voedsel**

**Vraag 1:** Kunt u vertellen op welke manier(en) reststromen worden verwerkt binnen uw bakkerij en waarom?

- a. Hoe lang doet u dat al?
- b. zijn er partnerschappen aangegaan om dit te doen?
- c. ziet u nog meer mogelijkheden?
  - a. waarom doet u dat nog niet?

**Vraag 2:** U gaf aan voornamelijk voor klanten reststromen circulair te verwerken.

- a. Waarom is deze stakeholder zo belangrijk?
- b. Zijn er ook andere stakeholders belangrijk?

**Vraag 3:** Wat zijn de obstakels die u tegenkomt als u reststromen circulair wil verwerken en hoe zouden deze kunnen worden verholpen?

**Vraag 4:** Spoort u andere bedrijven ook aan om hun reststromen op dezelfde manier te verwerken dan u en waarom wel/niet?

- a. Ziet u trends ontstaan in het circulair verwerken van reststromen?

### **Onderwerp 6: Duurzaamheidsrapportage en circulair verwerken voedsel**

**Vraag 1:** Bent u eerder gaan rapporteren of eerder circulair gaan verwerken?

**Vraag 2:** Merkt u dat het ene het andere versterkt?

- a. Op welke manier is dat?

**Vraag 3:** Hoe belangrijk is circulaire voedselverwerking in uw duurzaamheidsrapportage?

### **Onderwerp 7: CSRD (met Sebastiaan overhebben)**

**Vraag 1:** wat vindt u van de nieuwe CSRD wetgeving?

- a. Denkt u dat de sector duurzamer gaat worden?
- b. Denkt u dat u meer wordt aangespoord circulair voedsel te gaan verwerken?
- c. Denkt u dat het haalbaar is?
- d. Wat voor hulp zou u nodig hebben om deze informatie te bewerkstelligen?