

**Bachelor's Programme in Design**

# Grounds for Collaboration

Designing Sustainable Partnerships between Coffee Shops and Spent Coffee  
Grounds Collectors

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## **Abstract**

Coffee shops generate a significant amount of spent coffee grounds (SCG) daily, constituting an inevitable byproduct of the coffee-making process. Extensive research has demonstrated the feasibility of recycling SCG, offering both environmental benefits and economic advantages for those engaged in SCG recycling. However, for the successful implementation of SCG recycling, a collaborative effort between coffee shops and SCG collectors is essential, as the former serves as a key source of SCG, and the latter recycles it. Regrettably, there exists a notable dearth of knowledge regarding the specific nature of collaboration required between coffee shops and collectors. This limited knowledge consequently hampers the practical application of SCG recycling initiatives.

Acknowledging this significant knowledge gap, this bachelor's thesis aims to undertake research to enrich the existing information referring to SCG collection and the dynamics of coffee shop-collector collaborations. A literature review was conducted, followed by interviews, in order to gather comprehensive insights on the subject. Furthermore, the study identified key intervention points that must be addressed when designing a collaborative SCG-recycling framework between coffee shops and collectors. Emphasizing the importance of sustainability, the thesis accentuated the establishment of ground rules for collaboration that consider the economic, social, environmental, and cultural considerations of coffee shop partners.

This thesis highlights two distinct types of intervention points as critical factors to consider when engaging in cooperation with coffee shops while respecting their sustainable balance. Firstly, motivators are pivotal aspects that encourage coffee shops to participate in collaborative efforts. Thus, they should be actively promoted during the collaboration process. Conversely, requirements represent the constraints and obligations that coffee shops must prioritize to effectively operate their businesses. It is crucial to avoid challenging these requirements, as doing so may hinder the coffee shop's willingness to cooperate.

To ensure the success of a collaborative endeavor between coffee shops and collectors, careful consideration must be given to both motivators and requirements. By designing a collaborative framework that addresses these aspects, a sustainable and fruitful partnership can be fostered, yielding mutual benefits for all parties involved.

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**Keywords** Spent Coffee Grounds, Collaboration, Recycling, Coffee Shops

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Otaniemi, 8 April 2023  
Emma Prost

## Abbreviations

SCG	Spent Coffee Grounds
EU	European Union
CS	Coffee Shop

# 1 Introduction

The European Union (EU) Commission aims to create a more sustainable environment by promoting a circular economy. A circular economy promotes reusing products rather than disposing of them as waste and extracting new resources (European Commission, 2017). In such an economy, all forms of waste, such as clothes, food, and obsolete electronics, are returned to the economy or used more efficiently. In 2015 the EU enacted an action plan to promote sustainable consumption and production patterns (European Commission, 2017). In this plan, the EU advocated actions that encourage waste prevention, reuse, and recycling. This is similar to the 3-R framework – Reduce, Reuse, Recycle, which favors "the minimization of resource use" (Kumar Verma, 2019, p. 3). The 3-R framework and the EU action plan aim to extend the life span of resources, materials, and goods, thereby reducing overall waste (Schmidt Rivera et al., 2020).

However, implementing the EU action plan may be challenging for small local enterprises, as there requires more information on how traders could extend their products' life span. This study focuses on one form of local enterprise, coffee shops, and how they manage their coffee waste or spent coffee grounds (SCG). SCG is the leftovers produced after the brewing process to make coffee. The learnings gained by analyzing how to recycle SCG as waste may apply to other areas in the coffee shop and other local businesses. Therefore, the focus is on coffee shops and how they recycle spent coffee grounds.

Coffee shops were chosen for this study as they are an example of an industry with a high rate of unavoidable waste. Also, coffee is the second most consumed beverage worldwide, creating considerable SCG (Scully et al., 2016). Coffee Shops create 1.88 kg of SCG per kg of coffee beans used (Cameron & O'Malley, 2016). The combination of coffee grounds and water creates an increase in waste weight. Therefore, extending the life span of coffee grounds would support the coffee shop industry in meeting the EU action plan goals.

However, limited knowledge is available to document the implementation of a collaboration between a coffee shop and an SCG collector. Not knowing how coffee shops and collectors should collaborate limits the practical implementation of SCG recycling. Due to the lack of sufficient knowledge on the subject, this thesis aims to collect intervention points aimed to assist the design of a framework for establishing a sustainable collaboration between a coffee shop and a collector. The thesis answers the main research question, *how can coffee shops be included in an SCG recycling collaboration with a collector?*

Through literature review, this work first gets background information on what an SCG recycling collaboration consists of and why it is important to implement it. It also studies different SCG recycling collaborations currently in place and attempts to understand how the SCG collaboration is being implemented. The literature review focuses on European organizations reusing SCG. It concludes with general collaboration guidelines. These guidelines identify the base of a recycling

collaboration between a coffee shop and an SCG collector. The main takeaways from the literature review will be provided at the end of the literature review chapter.

The following part of the thesis analyses small Finnish coffee shops and their eagerness to collaborate with an SCG collector. It identifies coffee shops' requirements and motivators that could be used as intervention points to convince coffee shops to collaborate. Interviews were conducted to achieve this. The interviews aim to answer the sub-research questions, *what would motivate a coffee shop to collaborate for SCG recycling?* and *how to use a coffee shop's motivators and requirements as intervention points to establish a collaboration?* The findings from the interviews will be summarized at the end of the findings chapter. The summary of the findings will be followed by a proposal showcasing how to shape a collaboration outline between a coffee shop and an SCG collector.

## 2 Literature Review

*This literature review examines the environmental and societal implications of SCG recycling collaboration and explores the connection between SCG recycling and sustainable development. Although SCG recycling is a small component in achieving sustainable development, it can be viewed as a step in the right direction, with the potential for its framework to be applied in other areas, thus further contributing to sustainable development.*

### 2.1 Sustainable Development

Sustainable development is a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, p. 41). This term was first introduced in the second half of the twentieth century when it gained popularity and became an officially recognized addition to today's lexicon. Sustainable development is nowadays valued and studied by researchers and designers aiming to regulate the overall pollution and waste of systems and technologies (Kumar Verma, 2019). As Kumar Verma (2019) states in their article, natural resources are *badly exploited*, and if the current *unsustainable development* does not decline, a *collapse* of the “inter-related systems of this planet” (Kumar Verma, 2019, p. 1) - also called “doom day” by Meadow et al. (1972), is to come. Sustainable development must be implemented to preserve the limited natural resources remaining on planet Earth.

There is a need to use resources carefully and sustainably. They must be saved to limit human pollution and ensure a viable future for the next generations. Besides, as the sustainable “window of opportunity” is closing faster than expected because of the stress imposed on Earth, the “urgency” to improve the environmental impact of human actions is growing (Ceschin, 2012, p. 6). In 2012, Ceschin (2012) already mentioned that the conditions for sustainability can only be met by improving human production and consumption “by at least ten times” (2012, p.6). Being now in 2023, global sustainability is still not optimal, especially after the detrimental environmental effects of the COVID-19 pandemic (Selvaraj et al., 2022). The increased need for sustainable development can be estimated. The European Commission, through its 2015 action plan, supports the careful and sustainable use of the remaining natural resources. It promotes waste prevention, reuse, and recycling, to implement sustainable development and resource-saving (European Commission, 2017).

Kumar Verma (2019) makes further comments about waste recycling. He argues that these recycling activities must respect a *sustainable balance*. He (2019) states that in order to enforce recycling projects in line with sustainable development, the projects, their actors, and their efficiency must sustain over time. In other words, they should not be challenged by external factors, such as conflicting

policies or limited economies. Consequently, for them to sustain, all four pillars of their sustainability -social, economic, environmental, and cultural- must be preserved (Kumar Verma, 2019). The implementation of recycling projects, including SCG recycling collaborations, should therefore prioritize the *sustainable balance* within their respective contexts.

## 2.2 SCG Recycling Processes

Recycling SCG consists of including it in a new production cycle for another use than making coffee. Many reuses of the SCG have already been tested. SCG was experimentally used for productions such as plastics or composites (McNutt, 2019; Saberian et al., 2021), bioenergy such as biofuels, biogas, bio-oil, or biodiesel (Battista et al., 2021; Rajesh Banu et al., 2020), and bioactive compounds (McNutt, 2019). As Bijla et al. state, the uses of SCG are *wide-ranging* (2022). SCG was proven to be a promising raw material with a wide range of possible environmentally friendly reuses (Bijla et al, 2022; Forcina et al., 2023). However, it is still unsure whether the implementation of these recycling processes ought to be entirely beneficial to society on an economic level. As Zabaniotou & Kamaterou (2019) state in their paper, “more studies are needed on the economic assessment [...] for realistic assessments” (p. 1) of SCG. Yet, for SCG recycling to remain profitable in the long term, it must stay affordable (Kumar Verma, 2019). Uncertain economic profitability is the reason why considerable demand for SCG recycling implementation is not currently popular. Some reuses, however, were proven to be profitable and are implemented nowadays in Europe. A couple of examples are presented here below.

The first example addresses mushroom fermentation, using SCG. A case study was made about NĀM, a mushroom production company collecting SCG from coffee shops and using it as an oyster mushroom fertilizer (Almeida Pires, 2021; *Coffee Development Report*, 2020). Since January 2020, NĀM uses three tons of SCG per month to grow one ton of oyster mushrooms (*History Nām Mushroom / Delta Cafés - NĀM Mushroom*, n.d.). Applying the conversion formula given in Pires's work, I calculated that NĀM saved one and a half tons of CO<sub>2</sub> from being released into the atmosphere monthly (Almeida Pires, 2021). In addition, NĀM plans on expanding their business, leading to more SCG recycling, and more CO<sub>2</sub> savings (Almeida Pires, 2021). NĀM's example illustrates the fact that SCG recycling can be profitable and sustainable.

Another example of SCG recycling is Biobean. Biobean is the world's biggest recycler of spent coffee grounds. After collecting spent coffee grounds, it dries them and either upcycles them or sells them as raw materials to various companies (*Bio-Bean / We Recycle Coffee on an Industrial Scale for a Circular Economy*, 2023). The Biobean industry was founded in 2013 and claims on its website to have recycled “over 30,000 tons of spent coffee grounds” (*There's No Such Thing as Waste Coffee! - Bio-Bean*, 2022). Pursuing this SCG recycling

business, Biobean is another example showing that an SCG recycling economy can be sustainable through time.

As illustrated with NÃM and Biobean, SCG-recycling economies have already been put in place and appear to be sustainable. This usage of SCG by the industries implies that a collaboration was agreed upon between a recycler – collector- and a coffee shop (Almeida Pires, 2021; Coffee Development Report, 2020). Guidelines that rule this collaboration should therefore be designed to ensure a successful collection of the SCG (Zabaniotou & Kamaterou, 2019).

It can be mutually beneficial for the coffee shop and the collector to recycle SCG. It can allow coffee shops to promote their environmental image, and it can allow collectors to financially benefit from extending the life of the SCG (Rajesh Banu et al., 2020). Nevertheless, since there hasn't been a strong demand for such a partnership yet, there is limited knowledge available on the design and implementation of this type of collaboration.

So far, the literature available only addresses the recyclability of SCG. Limited research is shared about the collaboration established between a coffee shop and a collector, preceding the recycling of SCG. Not knowing how coffee shops collaborate with a collector limits the practical implementation of SCG recycling. Zabaniotou & Kamaterou (2019) mention the lack of literature to support the implementation of SCG recycling. They state that there is an *urgent need* for “methodological approaches to design and estimation of the SCG collection systems” (Zabaniotou & Kamaterou, 2019, p. 1564). According to their research, it is essential to develop guidelines for SCG collection.

Ferreira & Ferreira (2020) propose an outline showcasing how to implement such a collaboration. Their paper (2020) is one of the first to highlight coffee shops' requirements and their importance in their decision to collaborate. It suggests that even though coffee shops may benefit from an SCG recycling collaboration, they may be required or motivated to refuse to collaborate, to prioritize their needs to run their business. These coffee shops' requirements may therefore be carefully considered in the proposal of a collaboration with an SCG collector.

Ferreira & Ferreira (2020) respectively name *enablers* and *barriers* as the motivators and requirements that influence the coffee shop's decision to collaborate. *Enablers* are concepts that motivate a coffee shop to join the collaboration. *Barriers* are constraints that inhibit a coffee shop from collaboration. They may challenge a coffee shop to agree to collaborate because they need to prioritize their resources. The goal is therefore to motivate the coffee shops to collaborate, using their motivators -or enablers, and going around their requirements -or barriers, to make the SCG recycling happen.

This thesis aims to identify these motivators and requirements. It ultimately proposes ways to use the motivators and requirements as intervention points to shape the outline of a sustainable collaboration.

## 2.3 Collaboration Settings

The need for a sustainable, designed collaboration is now justified. Additionally, the coffee shops' requirements are recognized as valuable considerations in the collaboration design.

In terms of collaboration, so far, the consensus is that it happens between a coffee shop and a collector. The coffee shop stores SCG on their premise, for the collector to pick it up and later recycle it. Further insights regarding the methods employed to collect SCG can be gleaned from the analysis of the existing collaborations mentioned earlier in the thesis, namely Nãm and Biobean. They are summarized in the list below.

- The SCG is collected from the coffee shop weekly
- The collection occurs by van or by bike
- The coffee shop likely donates the SCG to the collector

These insights set the foundation for the collaboration to be designed between a coffee shop and a collector. A basic collaboration between a coffee shop and an SCG collector should therefore follow these guidelines.

Aside from these guidelines, I gathered additional takeaways from the case studies analysis. These represent optional collection techniques proposed by collectors to coffee shops.

- Providing the SCG for recycling could benefit the coffee industry (*History Nãm Mushroom / Delta Cafés - Nãm Mushroom*, n.d.)
- Collaborating with a collector could allow coffee shops to save money (*Bio-Bean / We Recycle Coffee on an Industrial Scale for a Circular Economy*, 2023)
- Collectors could provide their partner coffee shops with equipment to facilitate the collection of SCG (Rajesh Banu et al., 2020)

This second set of takeaways does not consist of collaboration guidelines, like the ones presented above since they appear to be 'extras' proposed to coffee shops to motivate them to collaborate. Nonetheless, they are relevant to the design of a collaboration since they may have influenced the coffee shops' decision to collaborate. Proposing optional collection techniques entails that coffee shops have preferences in terms of collaboration with their collector. The collaboration variations could be used by collectors to adapt to their coffee shops' requirements, to motivate them to collaborate.

The analysis of the existing collaborations supports Ferreira & Ferreira's statement (2020), which emphasizes the importance of considering coffee shops'

requirements in the collaboration design. This consideration enhances the chances of a successful collaboration. Indeed, respecting the coffee shops' needs means respecting their sustainable balance. So, implementing a sustainably balanced collaboration that suits their needs means that the collection of SCG does not bother them. Thus, an unbothered coffee shop could continuously provide SCG to the collector, through time (Kumar Verma, 2019). Therefore, respecting the needs and requirements of coffee shops allows the implementation of a collaboration in line with sustainable development (Kumar Verma, 2019).

## **2.4 Conclusion of Literature Review**

Recycling SCG can save natural resources and financially benefit the actors of the recycling process. It can therefore contribute, at its scale, to sustainable development. The analysis of existing collaborations showed that the recycling of SCG starts with a supposedly free collection of SCG from coffee shops, approximately once a week, by van or bike.

Nevertheless, as Kumar Verma (2019) argues, for the collaboration to support sustainable development, it must be implemented considering the sustainable balance of coffee shops. The requirements of coffee shops, named barriers and enablers by Ferreira & Ferreira (2020), must be respected in the collaboration to ensure a successful and sustainable partnership. This goes along with the analysis of successful collaborations: the collaborations installed by N<sup>3</sup>AM and Biobean illustrated some adaptations made to meet the specific needs of the coffee shops involved.

This thesis explores the needs and requirements of coffee shops, in order to define an outline for a collaboration respecting their sustainable balance.

### **3 Research Approach**

The research question of this thesis – *How can coffee shops be included in an SCG recycling collaboration with a collector?* is an open-ended question. It requires detailed research and analysis of the coffee industry and SCG recycling processes. In agreement with Merriam (2002), qualitative research is an adequate research approach to conduct in-depth exploration and answer open-ended questions. A basic interpretive qualitative study is conducted for this work with which basic interviews and document analysis methods are followed (Merriam, 2002).

#### **3.1 Inductive Approach**

This study aims to design a collaboration outline between a coffee shop and an SCG collector. Limited knowledge is shared in the case of this research topic. To overcome this limited knowledge of the research topic, an inductive approach must be undergone (Merriam, 2002). Indeed, while quantitative research aims to test theories and hypotheses, the general goal of qualitative research is to generate theories (Bryman & Bell, 2011). Theories were detected and discovered in this research once the empirical material was interpreted and targeted to answer the research question.

#### **3.2 Critical Reflections**

Subjective decisions and interpretations are allowed by qualitative study, during the analysis of the collected material (Merriam, 2002). Based on the work of Merriam (2002), qualitative study gives the possibility to determine what information is essential to the given study. It applies independent ways of viewing input data based on experiences and personal preferences. Consequently, the results presented in this work will most probably differ from others who may conduct the very same study.

As Merriam states (2002), attaining different results from the same study may disturb quantitative researchers. Indeed, quantitative researchers would argue that a finding's validity is proven through numbers in a statistical sense, through generalizability, when qualitative researchers rarely receive samples generalizable to greater representations. However, as Winter (2000) praises, the independent, possibly subjective results from qualitative research do not alter the validity of the findings from qualitative research. Indeed, qualitative study is rarely generalizable, since the sample size for such study is often narrow. However, in line with the aim of qualitative study being in-depth, small sampling allows a detailed analysis of each situation, and a selection of relevant informants based on precise criteria (Merriam, 2002). These qualitative elements lay the foundation for optimized general conclusions from the empirical findings.

#### **3.3 Interviews**

Interviews are the most widely used method in qualitative research. Their popularity in this type of study is due to the flexibility it holds when asking questions and looking for answers (Bryman, 2018). In the case of this study, flexibility is required as it aims to answer a question of exploratory nature. It intends to understand an unexplored area: coffee shops' requirements before and during entering the SCG recycling economy. This is why interviews were chosen as a study method. Having a flexible approach to the findings during the research will be beneficial to the study as it will allow a certain kind of adaptation to probable discoveries and unexpected findings.

More precisely, I chose to conduct semi-structured interviews during this study. Indeed, although the area of investigation –a collaboration between coffee shops and SCG collectors- is sufficiently demarcated, the discoveries to make about the coffee shops' motivators and requirements to collaborate are yet uncertain. Due to this uncertainty and the ignorance of how to get this information –for example, what question to ask if an unexpected, interesting topic arises? - semi-structured interviews were selected to make the exploratory research optimal. The semi-structured interviews were conducted during a period of 30 to 50 minutes each, which I considered to be an appropriate time to collect material of value.

A semi-structured interview is usually based on an interview guide with relatively specific subjects or fundamental issues that qualitative researchers want the interviewee to touch upon (Bryman, 2018). Following Bryman's definition, I established an interview guide containing simple and unclosed questions. The interview guide focuses on the interviewees, their coffee shop, and their view on a possible collaboration (see Appendix A.2 and A.3). The aim to use such an interview guide was to provide an adequate amount of guidance to the interviewees, and to receive answers relevant to the study topic. It was important to ensure that the questions concocted on call during the interviews would not excessively control the path of the interview and model the answer of the interviewees towards preconceived notions or theories I had in mind.

In a semi-structured interview, questions or themes ought not to be given in the original order presented in the interview guide. They do not need to originate from the interview guide at all either (Bryman, 2018). If a question logically connects with the aims of the interview, it can simply arise in connection with what the interviewee expresses. During the semi-structured interviews, I, therefore, formulated on-demand questions and restructured the order of the questions from the interview guide. Following the semi-structured interview commands led to discussions rich in content as well as in-depth discoveries about the research topic. It also allowed a smoother conversation flow which seemed to put the interviewees at ease. All interviews were held in English, apart from one interview held in French. However, to enable the readers' understanding, I translated the French interview to English in the summarized interview codebook (see Appendix A.4).

### **3.4 Material Management and Complications**

All interviews were recorded and transcribed. The findings of the interviews were later gathered into a codebook. Bryman (2018) emphasizes the use of recording and transcribing as tools to ensure a full knowledge base, and to lower the likelihood that crucial information would be lost during an interview due to human error. For example, human error could entail losing attention, multitasking, or missing the opportunity to ask follow-up questions. As Bryman (2018) points out, transcribing is a time-consuming task that also encourages subsequent analysis. A considerable amount of the analysis takes place during the transcription. It is therefore essential to have most information saved and available from the recording.

The complications encountered while conducting interviews were mostly related to Wi-Fi connection in coffee shops. The Wi-Fi was not always available in the coffee shops, which became a problem when saving the consent forms signed by the interviewees. Since the consent forms were not printed on paper, they had to be signed digitally on a tablet or a computer. However, due to the absence of Wi-Fi and my not noticing, a consent form was lost. The consent form in question was later redone.

A last inconvenient situation occurred when one of the interviews could not be conducted in the coffee shop premise managed by its interviewee. This situation was inconvenient because the interview aimed, among other things, at getting information about the coffee shop. All facts and information about the premise, equipment or other practical data about the coffee shop could therefore not be checked. The coffee shop and its equipment, therefore, had to be described orally by the interviewee or explored and analyzed visually through pictures. This was less convenient and reliable than an in-person visit.

### **3.5 Sample**

To ensure that the aim of the qualitative study was met, the selection of study informants had to be analytical and selective. As Halkier (2010) states, sampling cannot be random when it comes to qualitative research because there are typically few participants—at least fewer than in quantitative research. So, the selection sample should be carefully considered using valuable criteria. This sampling is called a purposive sampling technique. As stated in Bryman's (2018) work, for a purposive sampling collection, researchers choose research subjects whom they believe will provide valuable and informative data to answer the research question. To determine the conditions and requirements set by coffee shops for collaboration in a partnership with a collector, I opted to interview two distinct groups: coffee shop owner-managers and designers. I chose to interview coffee shop owners and managers because they are responsible to make decisions and changes in coffee shops. This type of interviewee can bring valuable insight into the coffee shop's use, management, change drivers, and change conditions. Coffee shop owners and managers will be referred to as *CS interviewees* in this work.

It would have been optimal to interview a coffee shop owner/manager who had already been canvassed to join an SCG recycling collaboration. Indeed, these coffee shop owner-managers would have been familiar with the conditions of collaboration and could have therefore brought insightful information about the collaboration they were proposed with. However, unfortunately, none of the canvassed candidates I contacted answered the interview requests.

The designers -the second group of interviewees- were selected based on two criteria: knowing about sustainability and design thinking and being familiar with coffee shops and coffee shop management. Thanks to them knowing about both sustainability and coffee shops, they were able to recognize a coffee shop identity, pinpoint their needs, and could ideate about ways to introduce SCG recycling in coffee shops while respecting their needs. Their insights from the two plans helped me make links and get a better understanding of how to design a sustainable collaboration outline between a coffee shop and a collector. The designers will be referred to as design interviewees in this work.

### **3.6 Contact Methods**

Different contact methods were used to acquire the final sample: convenient sampling, indirect contact, and direct contact. Since I had a clear idea of the sample I wanted for the interviews, I directly contacted and recruited most of the persons I interviewed. Out of the four CS interviewees I recruited, three of them were recruited door-to-door, and one through direct message on Instagram. I attempted to recruit more CS interviewees using indirect contact, through an open request message in a Facebook group. However, the process was not fruitful. I contacted and recruited all design interviewees through direct contact, using convenient sampling. One designer was recommended to me, using the snowball technique, by a design interviewee I had already contacted and recruited. All design interviewees were contacted by text message through Telegram.

The area of responsibility of all interviewees and the coffee shops name of all coffee shop actors are mentioned in Table 1. Sharing this type of information is believed to add further credibility to the sample (Aguinis & Solarino, 2019).

All interviews were conducted in person, either in Helsinki or in Espoo, Finland. Most of the interviews with the CS interviewees were conducted in the interviewees' coffee shops. Only one interview did not occur in the CS interviewee's coffee shop. The interviews with the designers occurred in open working spaces. The interviews lasted from 38 minutes to 58 minutes. All interviews were recorded to prevent missing information later when transcribing the interviews and gathering the findings. After presenting the interview topic, all interviewees were asked for their consent to be recorded and signed a consent form before the start of the interview. A template of the consent form can be found in the Appendix. Table 1 below summarizes the valuable information presenting the sample of interviewees.

Interviews	Role	Place	Time
Design interviewee 1	Creative Sustainability Design Student	In-person -Espoo	45 Minutes
Design interviewee 2	Collaborative and Industrial Design Student	In-person - Espoo	38 Minutes
Design interviewee 3	Collaborative and Industrial Design Student	In-person - Espoo	49 Minutes
CS interviewee 1	Barista - Kahiwa	In-person - Helsinki	48 Minutes
CS interviewee 2	Coffee shop owner - Café Scallion	In-person – Helsinki, Café Scallion	43 Minutes
CS interviewee 3	Coffee shop manager – One Day Café	In-person – Helsinki, One Day Café	27 Minutes (+ 30 minutes notes)
CS interviewee 4	Pastry-coffee Shop Owner – Le Jardin	In-person – Helsinki, Le Jardin	58 Minutes (in French)

Table 1. Interview participants information

### 3.7 Collaboration Proposal Simulation

During the interviews, I presented the concept of SCG to the CS interviewees. I then described the different collaboration variations discovered during the literature review to the CS interviewees. Once the different collaboration variations were introduced to the CS interviewees, I initiated a role play. I simulated being a collector wanting to collaborate with the CS interviewee to get their SCG. For each collaboration variation, I asked the CS interviewees if they would accept to collaborate with me. The goal of this simulation was to identify what motivates CS interviewees, or coffee shops, to collaborate. The scenarios proposals aimed to answer the sub-research question *what would motivate a coffee shop to collaborate for SCG recycling?*

### 3.8 Analysis and Interpretation

The analysis of the interviews was done first with a full transcript of each interview. All interviews were read several times, which allowed me to get familiar with the content of the interviews.

The interviews were divided into two categories: one category for the CS interviewees -four interviews, and one category for the design interviewees -three interviews. The interviews with the CS interviewees aimed to identify their interests, motivators, and dissuaders to accept an SCG recycling collaboration, as well as to assess their knowledge about sustainability and their coffee shop's

environmental impact. The designers' interviews aimed to review the management of coffee shops from a strategic point of view and to suggest ways to convince coffee shops to collaborate. The findings from each category of interviews were summarized in mind maps (see Figures 1 and 2), and later converted into two codebooks (see appendix).

The analysis took advantage of the exploratory nature of the qualitative study by being non-systematic and by identifying interesting content from the individual interviews (Kvale & Brinkmann, 2014). The recurring or interesting contents addressed during the interviews were gathered into themes and categories. These categories became codes in the summarized interview codebooks. This type of analysis was attentive, but with a gaze as free and open as possible. It implied an open coding: observing rather than seeking. These codes were refined, reformulated, and/or combined, resulting in the final codes and codebook of this study (Rennstam & Wästerfors, 2015). Codes, in this kind of open data-driven coding, are not quantified. Instead, they are compared. A qualitative analysis is created regarding their context, the effects of their actions, and how they relate to one another (Kvale & Brinkmann, 2014). An analysis of similarities inside and across codes is carried out in the discussion to create concepts, ideas, and theories.

### **3.9 Ethical Considerations**

Questions about moral and ethical issues came up during the interviews. According to Kvale and Brinkmann (2014), ethical issues should be discussed throughout the interview process due to the uneven power dynamics that exist between the interviewer and the interviewee.

To ensure informed consent, interviewees must understand and agree with the purpose of the study and the role of their participation in achieving that purpose. Participants in the interviews were provided with a clear and concise description of the study's purpose and objectives to ensure transparency and comfort. This was accompanied by a consent form, allowing the participants to decide whether they would like to be interviewed, recorded, and anonymized. The participants who agreed with the study's purposes and their participation in it were invited to sign the consent form. All interviewees signed the consent form and therefore were interviewed and recorded. None asked to be anonymized. These ethical precautions were carefully taken to build trust with the interviewees, protect the reputation of the coffee shops, and maintain positive relationships with the interviewees (Kvale & Brinkmann, 2014). The interviewees' rights -to use the content of the interview and be anonymized, were reminded at the end of the interview in case any of the interviewees changed their mind during the interview.

Figure 1. Interview findings from the coffee shop actors' interviews.

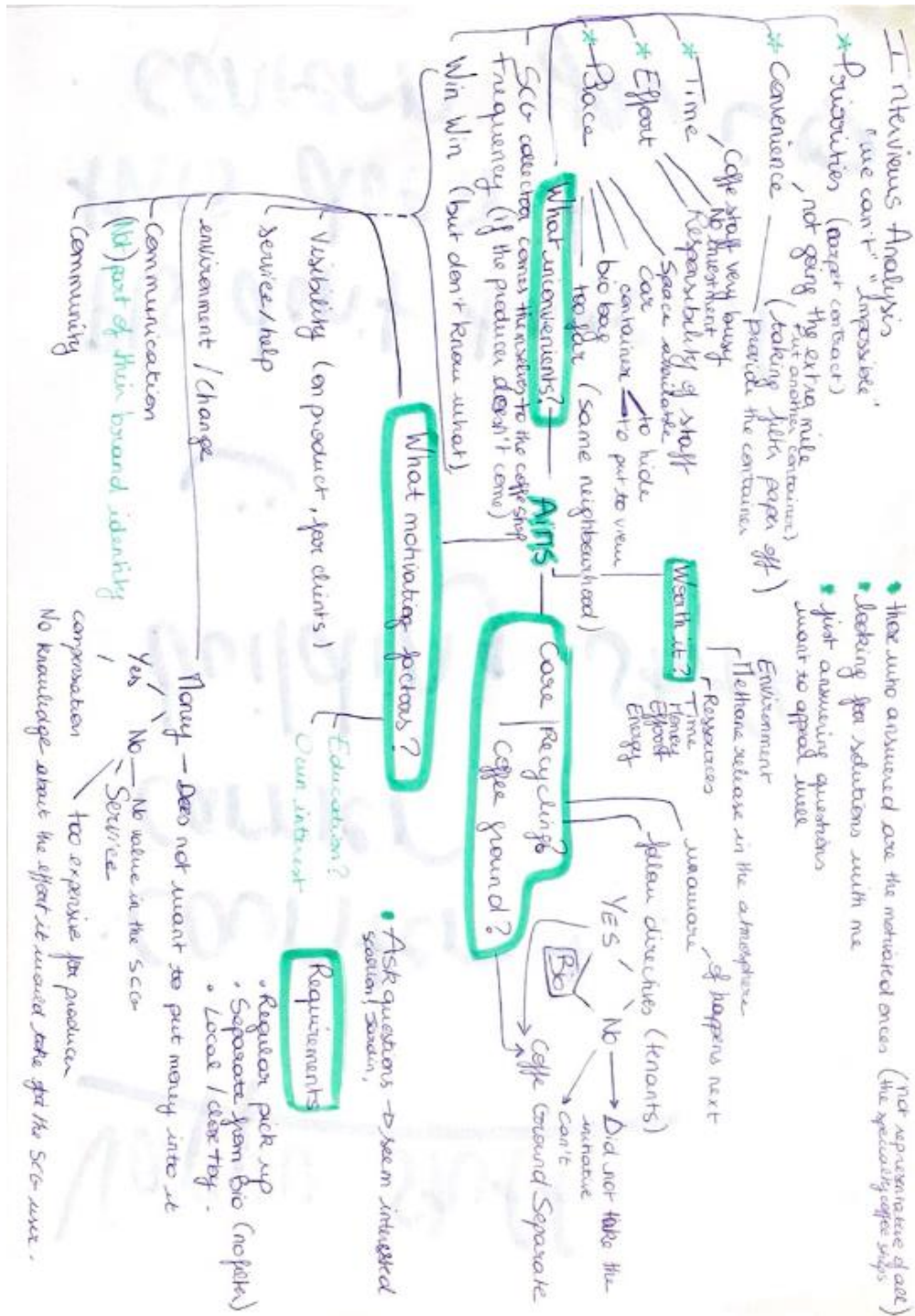
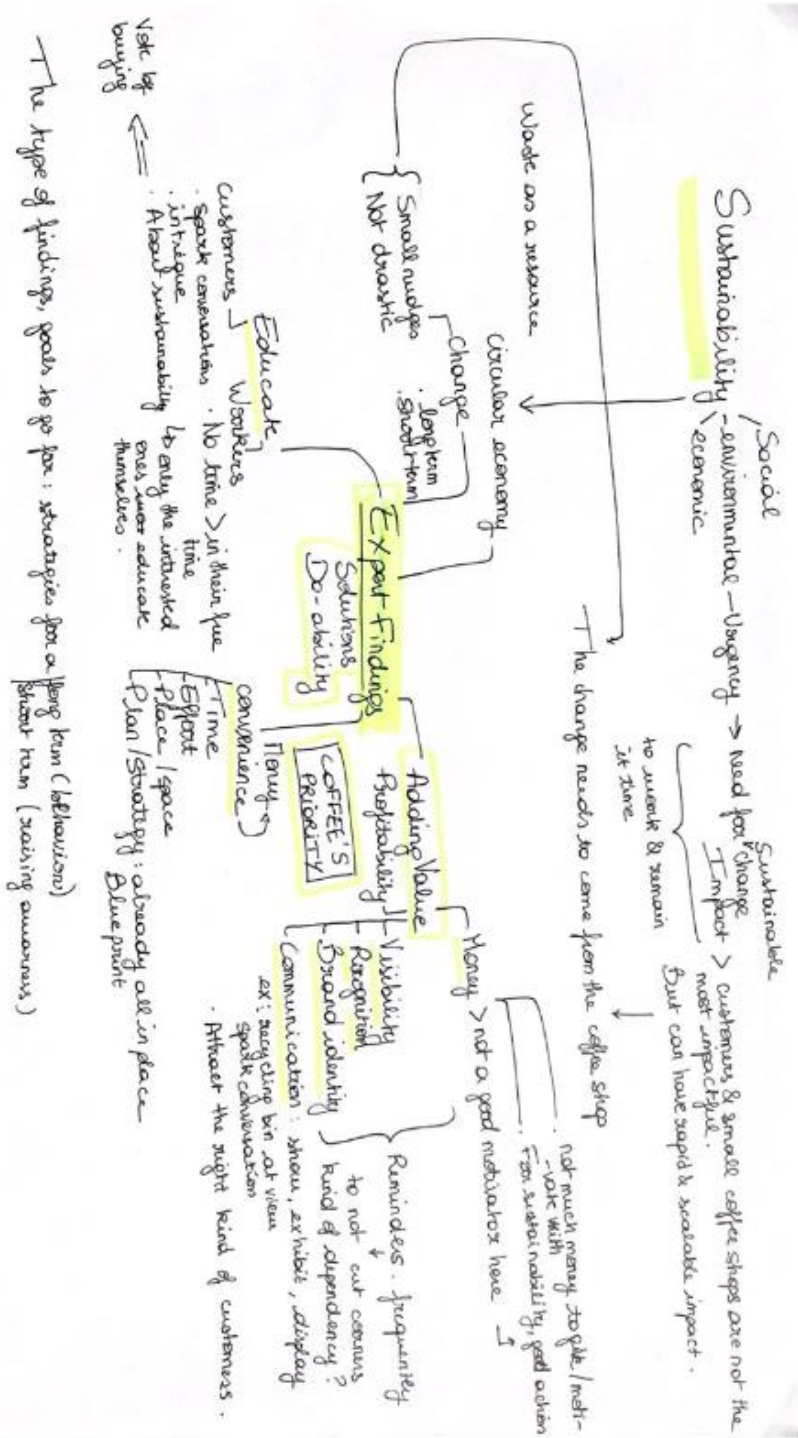




Figure 2. Interview findings from the designers' interviews.



Purpose: Explore the benefits & challenges of coffee recycling for the environment & coffee shops.



## 4 Findings

As demonstrated during the literature review, a sustainable collaboration outline between a coffee shop and an SCG collector should be designed. The initial step in SCG recycling collaboration, defined in the literature review, involves collecting SCG from coffee shops, typically weekly, using either a van or a bicycle, and with the assumption that the SCG is provided free of charge. Implementing such collaboration is a promising opportunity to reduce waste and support sustainable development. However, to ensure that the collaboration aligns with the sustainability development requirements, it is essential to adapt it to the specific needs of the coffee shops. Interviews were conducted to identify these needs and answer the first research question, *what would motivate a coffee shop to collaborate for SCG recycling?*

### 4.1 Motivators and Requirements as Points of Design Interventions

#### 4.1.1 Coffee Shops Presentation

Before starting this findings analysis, it is important to remember that none of the CS interviewees were canvassed by a collector or proposed to take part in an SCG collection before being interviewed. Accordingly, the CS interviewees were not familiar with their requirements regarding such partnerships. They were asked their opinion upon SCG recycling collaboration for the first time, forthwith during the interviews. Their answer may thus not be considered a completely accurate representation of their opinion. However, the consistency in the answers of the four CS interviewees validates the quality of the answers and gives a credible overview to be used for this study. Besides, the answers of the designers –who themselves were more familiar with the addressed topic- matched the ones of the CS interviewees on several topics. I, therefore, concluded that the answers of the CS interviewees were creditable, despite the context under which they were answering these questions.

The four CS interviewees manage coffee shops that have different attributes. Table 2 gathers and compares the different attributes defining each coffee shop that was assessed during this study. From visits and pictures of the coffee shops, I was able to assess the size of each coffee shop, as well as the products they sell. Through online research, I found the founding year of each coffee shop. During the interviews, I identified each coffee shop's recycling system and SCG management. Finally, each CS interviewee presented the identity of their coffee shop - the way they present themselves to their customers, which I included in the table as well.

	CS Interviewee 1	CS Interviewee 2	CS Interviewee 3	CS Interviewee 4
Coffee shop name	Kahiwa	Café Scallion	One Day Coffee	Le Jardin

Size	50 < seats	Seats < 20	Seats < 20	Seats < 20
Founding year	2017	2020	2021	2022
Products	Coffee, food & other drinks	Coffee, food & other drinks	Coffee	Coffee, food & other drinks
Identity	“Your very social living room”	“Cafeteria”	“What the customers don't [about coffee], know we can educate them”	“It is a French bakery-pastry shop where you can enjoy a good coffee” “can explore”
Sustainability awareness	Aware	Not aware	Somewhat aware	Not aware
SCG recycling	None	≈ 400g reused per week as a body scrub	None. Used to be recycled for kombucha	None
SCG management	Throw away in biowaste	Throw away in biowaste	Throw away in mixed waste	Throw away in mixed waste

Table 2. Coffee shops presentation

#### 4.1.2 Collaboration Scenarios

*During the interviews, I pretended to be a collector interested in partnering with the CS interviewee to recycle their SCG. I presented the CS interviewees with different types of collaborations. For each different collaboration scenario, I inquired whether the CS interviewees would be willing to partner up.*

The unanimity of the CS interviewees showed interest in providing their SCG for recycling. CS interviewee 1 said that they “would 100% be down to explore that” (Interview, March 1, 2023). CS interviewee 2 replied that they “would accept it, of course” (Interview, February 27, 2023). CS interviewee 3 thought that it was “a brilliant idea” and that they “would be happy to give” their SCG (Interview, February 28, 2023). Finally, CS interviewee 4 responded that they would “give them [SCG collectors] spent coffee grounds” (Interview, March 8, 2023).

The main reason for the CS interviewees to agree to provide their SCG was that SCG is considered a *waste* (CS interviewee 1, Interview, March 1, 2023) with no value to them. As CS interviewee 2 said, “Well, it's a waste. Why try to get some extra gain for yourself, for nothing?” (Interview, February 27, 2023). CS interviewee 2's statement depicted the absence of value in SCG for the interviewee. This absence of value in SCG motivated the CS interviewees to give it away for recycling.

The CS interviewees seemed content with the possibility to donate their SCG for recycling. None of them used vocabulary implying *exchanging* or *selling* their SCG. Instead, two of them used the term ‘give’ when referring to providing

their SCG to collectors (CS interviewee 3, Interview, February 28, 2023; CS interviewee 4, Interview, March 8, 2023). This vocabulary choice showed that the CS interviewees were not particularly interested in gaining anything in exchange for their SCG. They simply agreed to provide their SCG to a collector as a gesture of goodwill.

In general, CS interviewees had a similar approach to their participation in the collaboration. They seemed interested in the same type of collaboration: simply storing and providing the SCG, which should, nevertheless, be picked up by the collector. The CS interviewees did not show interest to get further involved in the collaboration than simply providing the SCG. They were agreeing to provide the collectors but were not willing to go out of their way when doing so. CS interviewee 3's response illustrates this statement: "As long as we don't have to deliver" (Interview, February 28, 2023). In general, a passive approach to the collaboration was popular. The reason why was investigated further during the interview analysis.

#### **4.1.3 Motivators and Requirements**

A pattern stood out when CS interviewees replied to the different collaboration scenarios proposals. I noticed that the answers of the CS interviewees referred to either *interest* or *capacity*. The *interest* type of answer includes replies such as "Would be happy to" (CS interviewee 3, Interview, February 28, 2023), "accept" (CS interviewee 2, Interview, February 27, 2023), or "want" (CS interviewee 4, Interview, March 8, 2023). It refers to the interviewee's subjective interest to collaborate. Interest would be what motivates the CS interviewees to collaborate.

The *capacity* type of answer includes replies such as "impossible" (CS interviewee 1, Interview, March 1, 2023) or "can't" (CS interviewee 4, Interview, March 8, 2023). It refers to requirements that are strictly out of the interviewee's control. The CS interviewees must prioritize these requirements from the collaboration. An attracting collaboration, for the CS interviewees, would therefore spark interest, motivate them to join, and not overlap with requirements.

##### **4.1.3.1 Motivators**

The more interest the CS interviewees would have in the topic of SCG recycling, the more motivated they would be to collaborate. Three elements defining and influencing this motivation were identified:

- *Gain* –the CS interviewee would gain from taking part in the project. The gain could be monetary or non-monetary. CS interviewee 4 appeared interested in monetary gains, "I don't want it to cost me anything. Unless they pay me afterward. If they buy it from me that's another subject" (Interview, March 8, 2023). Money seems to be a major gain motivator for coffee shops. Designer interviewee 1 supported the idea of

gain and reminded me of the importance of considering “the aspect of added value” to the collaboration (Interview, February 7, 2023).

- *Identity* –the CS interviewee would be interested because it would fit their value and/or the brand identity of their coffee shop.

If the collaboration proposal fits the identity of the coffee shop, the CS interviewee would see an interest in collaborating. Communicating about the collaboration could attract a clientele interested in SCG recycling, or sustainability. As designer interviewee 3 argued, like-minded customers would *privilege* the collaborating coffee shop to support their initiative (Interview, March 3, 2023). Two CS interviewees seem to have a matching coffee shop identity to the one of the SCG recycling. CS interviewee 1 (Interview, March 1, 2023) indeed mentioned having already hosted zero-waste events. Besides, CS interviewee 4 (Interview, March 8, 2023) said wanting to explore new alternatives through his coffee shop.

- *Awareness* –the more the CS interviewee knows about the topic, the more they can tell if they are interested in the topic and want to help. Awareness is the last motivator mentioned by both the CS interviewees and the designer interviewees. There was a correlation between the awareness of CS interviewees about sustainability and their coffee shop’s impact on the environment, and their motivation to collaborate. The more the CS interviewees were aware, the more they were motivated to collaborate.

Gain, Identity, and Awareness were reported as motivators of coffee shops to start a collaboration.

#### 4.1.3.2 Requirements

When replying to the collaboration scenarios proposals and using a *capacity* type of answers, the CS interviewees referred to their requirements. Examples of their replies were, “*I can’t ask my staff*” (CS interviewee 4, Interview, March 8, 2023), “If it's going to cost me more for them, business-wise *I can't do that*” (CS interviewee 4, Interview, March 8, 2023), “*I have to put my mind to my energy and my time, so that would not work for me*” (CS interviewee 2, Interview, February 27, 2023), “space might be the only *issue*” (CS interviewee 1, Interview, March 1, 2023) or “it does become a little bit more work and quite inconvenient or *impossible* maybe for cafe workers” (CS interviewee 1, Interview, March 1, 2023). The requirements that were mentioned by the CS interviewees are:

- Free time –The CS interviewee may not have time to put in the collection and/or delivery of the SCG
- Working staff –The CS interviewee may not have employee(s) to invest their time into the collaboration

- Space available to use –the coffee shop’s premise may be too small to provide a space to store the SCG in
- Money –the CS interviewee may not afford to buy equipment or their staff’s time to collect and store their SCG

I assumed that these requirements are out-of-reach for the CS interviewees. This means that a radical effort from them would be required to change these requirements. Hence the use of the words *impossible* or *can’t* in the CS interviewees’ answers. Time, Staff, Space, and Money are requirements that coffee shops must consider and prioritize before starting a collaboration.

The first part of this interview analysis answered the sub-research question *what would motivate a coffee shop to collaborate for SCG recycling?* The interview analysis identifies motivators and requirements to be what motivates a CS interviewee to collaborate. The CS interviewees consider these motivators and requirements when deciding to collaborate –or not- with an SCG collector. The CS interviewee is motivated to collaborate under two conditions:

- If the collaboration sparks the interest of the CS interviewee
- If the coffee shop’s requirements are respected and untouched

#### 4.1.4 Contextualizing Coffee Shops

Motivators and requirements were defined in the previous section. However, they are not present in all coffee shops with the same intensity. Indeed, the answers of the CS interviewees, when being proposed different scenarios, varied depending on the scenarios and depending on the CS interviewees themselves. The answer of the interviewees for each scenario was analyzed and compared with each other. For example, when being asked to deliver their SCG to a collection point, one CS interviewee radically refused, while another accepted with a condition. CS interviewee 2 said, “I have too many things, too less hours in the day to spend the time for [SCG delivery]. I have more other things where I have to put my mind, my energy, and my time, so that would not work for me.” (Interview, February 27, 2023). In comparison, CS interviewee 4 replied, “I’m willing to do the work for them but I want something in exchange too.” (Interview, March 8, 2023). The replies from these two CS interviewees were here radically different. They showed that the CS interviewees considered different requirements when being proposed to deliver SCG to a collection point. For one CS interviewee, the main concern was about time and effort, while for the other, it was about money. Coffee shops therefore present requirements of different intensities.

Likewise, CS interviewees present motivators of different intensities. For example, CS interviewee 1 was much aware of the concept of sustainability and the environmental impact of their coffee shop. On the other hand, CS interviewee 3 had limited knowledge about the topic, and CS interviewee 4 was not aware at all of it.

Coffee shops therefore present motivators and requirements of different intensities. Table 3 compares the motivators (green section) and requirements (blue section) of all four coffee shops from the interviewees. The purpose of the table is to set a profile for each coffee shop, the profile identifies and compares the motivators and requirements that each coffee shop has. For each motivator and each coffee shop, the table asks: does this coffee shop present this motivator for an SCG-recycling collaboration? For each requirement and each coffee shop, the table asks: does this coffee shop need to prioritize this requirement over the collaboration? If the answer to these questions is positive or rather positive, the box associating the resource with the coffee shop is ticked.

	coffee shop from CS Interviewee 1	coffee shop from CS Interviewee 2	coffee shop from CS Interviewee 3	coffee shop from CS Interviewee 4
Awareness	X		X	
Identity	X		X	X
Gain	X			X
Time	X	X	X	X
Staff	X	X	X	X
Space		X		X
Money	X	X	X	X

Table 3. Coffee shops' unique profile.

Table 3 can be used to empathize with the coffee shops' status. The content of this table illustrates how a coffee shop approaches a collaboration proposal. A coffee shop profile ought to guide the design of a sustainable collaboration outline adapted to a coffee shop.

#### 4.1.4.1 Coffee Shop Profile Example 1: CS Interviewee 1

The CS interviewee is aware of sustainability, they aim to reduce the environmental impact of their coffee shop and would likely gain customers by communicating on their sustainable collaboration initiative. Their requirements, nonetheless, are not much available. The coffee shop, nonetheless, presents requirements: it does not have available staff and money to use for the collaboration. These requirements limit the type of collaboration that the coffee shop could join. However, it does not entail that collaboration is unlikely between this coffee shop and a collector. The CS interviewee is still "very open to the idea" (CS interviewee 1, Interview, March 1, 2023). Instead, this means that the collaboration must not ask the coffee shop to invest too much time, workforce, or money in the collaboration.

#### 4.1.4.2 Coffee Shop Profile Example 2: CS Interviewee 2

The CS interviewee does not present any motivator. Indeed, they are not aware of the environmental situation of SCG, and they do not plan to include their

collaboration in their brand identity. The coffee shop would therefore not gain from collaborating. In addition, the CS interviewee presents limiting requirements. The interviewee cannot provide time, workforce, space, or money for the collaboration. The lack of motivators and overall incapacity of the coffee shop to invest resources limits the collaboration. However, here again, even though a collaboration seems more challenging than CS interviewee 1, this does not entail that a collaboration is unlikely between this coffee shop and a collector. The CS interviewee still agrees to provide their SCG: “I would accept it, of course” (Interview, February 27, 2023). It will in this case be the collector’s choice to decide if they want to collaborate with this coffee shop

The coffee shop profile facilitates the design of a collaboration outline between a coffee shop and a collector. In line with Kumar Verma’s work (2019), the collaboration outline should be adapted to the coffee shop’s requirements and motivators. As design interviewee 1 stated, the collaboration should be “designed with them or provided to them as a framework that would really suit them” (Interview, February 7, 2023). The collaboration should involve the coffee shop to the extent of its available resources. The plan should not ask the coffee shop for more than they can provide.

General coffee shops’ motivators and requirements are now defined, and the unique coffee shops’ profile of the interviewed participants was established. The last part of the interview analysis consists of understanding how to use these motivators and requirements to shape a sustainable collaboration outline. The last part of the interview analysis aims to answer the last sub-research question, *how to use a coffee shop’s motivators and requirements as intervention points to establish a collaboration?* It aims to showcase how to promote motivators and acknowledge and respect the requirements of coffee shops.

## **4.2 Validating Motivators and Requirements as Intervention Points**

How could a collaboration go around the requirements of coffee shops? Design interviewee 3 suggests navigating around the restricting requirements of coffee shops. They gave an example for navigating around space requirements. To face the lack of space behind the counter in coffee shops to store the SCG, they proposed to use an aesthetically pleasing container to put in sight of the customer, in the customer area (Design interviewee 3, Interview, March 3, 2023). This suggestion would allow the coffee shops to save their limited working space while participating in the SCG-recycling collaboration. It would resolve the *there's-no-space-for-it* problem from coffee shops, as designer interviewee 3 said (Interview, March 3, 2023).

For instance, this solution addressing the space issue could please CS interviewee 4 who did not have much available space behind the counter in their coffee shop. The CS interviewee indeed showed interest in using “something a little elegant” (CS interviewee 4, Interview, March 8, 2023) to store their SCG in, on sight in their coffee shop. Besides, as Design Interviewee 3 claimed, having a visible SCG recycling container in the coffee shop could raise interest from the consumers. The collection container could “spark conversation” (Design Interviewee 3, Interview, March 3, 2023), creating a connection with the customers. This could become an advantage for the coffee shops like CS Interviewee 4’s, which identify their coffee shop as an explorer. The visible container in the coffee shop could therefore fit their brand identity, spark conversation and interest, and attract a like-minded clientele.

“Letting the people that come into the coffee shop know what you're doing with the waste could be sort of a motivator, and people maybe would come more often or privilege certain places if they know.” (Design interviewee 3, Interview, March 3, 2023)

Design interviewee 1 revealed a last suggestion to facilitate the collaboration between a coffee shop and a collector. They suggested raising the awareness of coffee shop owners and managers ignorant of SCG sustainability. This suggestion could consist of a type of long-term solution for coffee shops that would present an awareness-motivator issue. This suggestion was also supported by design interviewee 2. This way, the coffee shop owners and managers, once informed about SCG recycling sustainability, could become interested and more motivated in collaborating with the SCG collector. Besides, once the coffee shop owners and managers would be educated about their environmental impact, they could educate their customers about their coffee shop’s sustainable actions. The coffee shops could therefore be used as a “place of exchange” (Design interviewee 2, Interview, November 21, 2022) and attract like-minded customers. This gain of customers could be considered a gain for the coffee shops, and a motivator to join the SCG recycling collaboration. Raising awareness could therefore be used as a long-term tool to convince coffee shops to join an SCG-recycling collaboration.

The suggestions from Design Interviewees 1, 2, and 3 showcase examples of how coffee shops could benefit from an SCG recycling collaboration without having their requirements bothered.

These examples show that a collaboration can navigate around coffee shops’ requirements and make the SCG collection possible. Only creative solutions are needed to bypass coffee shops’ requirements. Designers, known for their creativity and problem-solving mindset, could ideate more about suggestions to do so, in another paper.

## 5 Conclusion and Discussion

### 5.1 Summary of the Findings

This thesis aims to facilitate the successful implementation of a collaboration with a coffee shop, and proposes to answer the main research question: *How can coffee shops be included in an SCG recycling collaboration with a collector?* Through interviews with coffee shop owners, it identifies the elements that are expected to be considered in a collaboration, to respect a coffee shop's balance. The first sub-research question is here targeted: *What would motivate a coffee shop to collaborate for SCG recycling?*

The interview findings showed that coffee shops present a unique set of requirements and motivators, establishing their unique profile. Motivators are reasons for a coffee shop to collaborate, and requirements are constraints that a coffee shop must prioritize. Depending on their varying motivators and requirements, coffee shops would agree to participate in different types of collaborations. Consequently, it became important to set the profile of each coffee shop to propose an optimal personalized collaboration plan respecting their requirements and motivators. A set of general motivators and requirements overall present in the interviewed coffee shops, was established.

A coffee shop's motivators can consist of:

- *Gain* –what a coffee shop would gain, financially or else, from taking part in the project
- *Identity* –the collaboration initiative would fit the coffee shop manager's value and/or the brand identity of their coffee shop
- *Awareness* –the more the coffee shop manager knows about the topic, the more they can tell if they are interested in the topic and want to collaborate.

The requirements are constraints that coffee shops must prioritize to run their business. The requirements may inhibit a coffee shop from collaboration. They should not be challenged by it. A coffee shop's requirements can consist of:

- *Free time* –The coffee shop manager may not have time to put in the collection and/or delivery of the SCG
- *Working staff* –The coffee shop manager may not have employee(s) to invest their time into the collaboration
- *Space available to use* –the coffee shop's premise may be too small to provide a space to store the SCG in
- *Money* –the coffee shop may not afford to buy equipment or their staff's time to collect and store their SCG

A coffee shop manager/owner considers these motivators and requirements when deciding to collaborate –or not- with an SCG collector. They are convinced to collaborate under two conditions:

- If the collaboration is interesting and presents possible gains (motivators)
- If the coffee shop's constraints are respected and untouched (requirements)

Motivators and requirements represent intervention points when designing a collaboration between a coffee shop and a collector. It is possible to navigate around the coffee shops' requirements and to kindle coffee shops' motivation to collaborate. The interviewed designers, with their creative problem-solving mindset, gave a couple of examples regarding how to use the intervention points in the design of a collaboration.

## 5.2 Possible Implementations of the Findings

The intervention points identified during the analysis of the interviews facilitate the design of a sustainable collaboration respecting the sustainable balance of coffee shops. Fostering the implementation of a sustainable collaboration aims to allow the recycling of SCG, to comply with the European Commission's action plan, and to ultimately contribute to the overarching goal of sustainable development, at its scale.

Limited knowledge is available about the SCG collection and collaboration between coffee shops and collectors. By researching this topic, the study, therefore, extends the available information regarding SCG collection and coffee shop-collector collaborations. The interviews, guided by the literature review, present results that can be used to design a long-lasting, sustainable collaboration between a coffee shop and a collector. Designers who intend to create such collaboration can creatively utilize the findings of this thesis in their problem-solving process, just like the interviewed designers in this study. By doing so, they can benefit from the presented findings without having to conduct the research again.

There is a limited demand for SCG recycling to this day. However, since SCG is proven to be a valuable resource, this demand is expected to rise. In that case, the findings from this study will be available to guide the implementation of an SCG-recycling collaboration.

## 5.3 Main Limitations

The limitations of this study were primarily due to the restricted resources available to conduct this study. It succeeded, however, in defining intervention points to design a sustainable collaboration between a coffee shop and a collector, but the limited resources restricted the amount as well as the quality of the findings collected from the literature review and the interviews. Indeed, the lack of explicit

information from the literature review compelled me to make certain assumptions and draw conclusions based on the available implicit evidence.

due to this same limitation, I could not find coffee shop owners who had already been approached by collectors, proposing them a collaboration. As a result, the study was only able to provide superficial findings to the interview analysis. This study would benefit from being conducted once again, when more literature will be available on the matter and when more coffee shop owners or managers will be proposed a collaboration. SCG recycling is a field that is becoming popular, so more research is indeed expected to be published on this topic. An additional study tackling a similar research question as mine would present more valid results.

Another limitation consists of the limited number of coffee shop managers who were interviewed. This limited the exhaustive representation of the general opinion of coffee shops about SCG recycling. Even though it allowed an in-depth analysis of each interview, and detailed findings which were verified by the interviewed designers, the topic could benefit from more and bigger studies on the topic to confirm its validity further.

Also, the CS interviewees who agreed to be interviewed were open to the idea of sustainability and SCG recyclability. This interest in the topic may have been a reason for them to accept being interviewed. Consequently, if such a theory is confirmed, it entails that a part of the coffee shop industry –not interested in SCG recycling- would not be represented in the study. Therefore, the sample recruited for this study is not representative of the global coffee shop industry in that sense. Designers and researchers, when pursuing studies or implementing the findings regarding this research, should acknowledge these biases to get accurate results.

Finally, it was important to acknowledge that coffee shop owners/managers knew that the name of their coffee shop would appear in the thesis. Consequently, there is a risk that their answers during the interviews were phrased in a way that would positively represent their coffee shop. Their answers may therefore be biased and should not be blindly relied on. The results of the interviews may be approached with vigilance.

This thesis marks the beginning of a series of necessary research aimed at fully designing a successful and sustainable collaboration. Further research could focus on refining the collaboration outline, exploring specific implementation strategies, and evaluating the long-term impact of such collaborations on coffee shops and the environment.

[OBJ]

[OBJ]

## References

- Aguinis, H., & Solarino, A. M. (2019). Transparency and replicability in qualitative research: The case of interviews with elite informants. *Strategic Management Society*, 40(8), 1291–1315.
- Almeida Pires, A. M. (2021). *CaseStudy\_CircularEconomy\_SCG*.
- Battista, F., Zuliani, L., Fusco, S., & Bolzonella, D. (2021). Biodiesel, biogas and fermentable sugars production from Spent Coffee Grounds: A cascade biorefinery approach. *Bioresource Technology*.
- Bijla, L., Aissa, R., Lankifli, A., Bouyahya, A., Harhar, H., & Gharby, S. (2022). Spent coffee grounds: A sustainable approach toward novel perspectives of valorization. *Journal of Food Biochemistry*, 46(8).
- bio-bean | We recycle coffee on an industrial scale for a circular economy. (2023). <https://www.bio-bean.com/>
- Bryman, A. (2018). *Social Science Methods* (3rd ed.). Liber.
- Bryman, A., & Bell, E. (2011). *Business Research Methods*. (3rd ed.). Oxford University Press.
- Cameron, A., & O'Malley, S. (2016). *Coffee Ground Recovery Program Summary Report*.
- Ceschin, F. (2012). *The introduction and scaling up of sustainable Product-Service Systems A new role for strategic design for sustainability*. Politecnico di Milano.
- Coffee Development Report. (2020). [https://www.internationalcoffeecouncil.com/files/ugd/38d76b\\_4fc7b54a15f14a548b2f4a208c2eae6d.pdf](https://www.internationalcoffeecouncil.com/files/ugd/38d76b_4fc7b54a15f14a548b2f4a208c2eae6d.pdf)
- Dam, R. F., & Siang, T. Y. (2020). *Design thinking: A quick overview*.
- European Commission. (2017). *The role of waste-to-energy in the circular economy 2*. [http://ec.europa.eu/priorities/energy-union-and-climate/state-energy-union\\_en](http://ec.europa.eu/priorities/energy-union-and-climate/state-energy-union_en)
- Ferreira, J., & Ferreira, C. (2020). *From the grounds up: the coffee shop industry and the circular economy*.
- Forcina, A., Petrillo, A., Travaglioni, M., di Chiara, S., & De Felice, F. (2023). A comparative life cycle assessment of different spent coffee ground reuse strategies and a sensitivity analysis for verifying the environmental convenience based on the location of sites. *Journal of Cleaner Production*, 385.
- Halkier, B. (2010). *Focus groups*. Liber.
- History Nãm Mushroom | Delta Cafés - NÃM mushroom. (n.d.). Retrieved April 11, 2023, from <https://nammushroom.com/pages/sobre-nos>
- Kumar Verma, A. (2019). *SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL ETHICS*. [www.nesa-india.org](http://www.nesa-india.org)
- Kvale, S., & Brinkmann, S. (2014). *The Qualitative Research Interview* (3rd ed.). Student litteratur.
- Laurel, B. (2003). *Design Research: Methods and Perspectives* (B. Laurel, Ed.; 1st ed.). MIT.
- McNutt, J. (2019). Spent coffee grounds: A review on current utilization. *Journal of Industrial and Engineering Chemistry*, 71, 78–88.

- Meadows, D. H., Meadows, D. L., Randers, J., & Behrens III, W. W. (1972). *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (First Edition). Potomac Associates – Universe Books.
- Merriam, S. B. (2002). *Introduction to Qualitative Research* (1st ed.). Jossey-Bass. [https://stu.westga.edu/~bthibau1/MEDT%208484-%20Baylen/introduction to qualitative research/introduction to qualitative research.pdf](https://stu.westga.edu/~bthibau1/MEDT%208484-%20Baylen/introduction%20to%20qualitative%20research/introduction%20to%20qualitative%20research.pdf)
- Rajesh Banu, J., Kavitha, S., Yukesh Kannah, R., Dinesh Kumar, M., Preethi, Atabani, A. E., & Kumar, G. (2020). Biorefinery of spent coffee grounds waste: Viable pathway towards circular bioeconomy. *Bioresource Technology*, 302, 122821. <https://doi.org/10.1016/J.BIORTECH.2020.122821>
- Rennstam, J., & Wästerfors, D. (2015). Från stoff till studie-Om analysarbete i kvalitativ forskning. *Student Litteratur*.
- Saberian, M., Li, J., Donnoli, A., Bonderenko, E., Oliva, P., Gill, B., & Siddique, R. (2021). Recycling of spent coffee grounds in construction materials: A review. *Journal of Cleaner Production*.
- Selvaraj, S., Prasad, S., Fuloria, S., Subramaniyan, V., & Sekar, M. (2022). COVID-19 Biomedical Plastics Wastes—Challenges and Strategies for Curbing the Environmental Disaster. *Sustainability*, 14(11).
- There's no such thing as waste coffee! - bio-bean.* (2022, December 20). <https://www.bio-bean.com/news-post/zero-waste-week-no-such-thing-as-waste-coffee/>
- World Commission on Environment and Development. (1987). *Our Common Future*. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>
- Zabaniotou, A., & Kamaterou, P. (2019). Food waste valorization advocating Circular Bioeconomy - A critical review of potentialities and perspectives of spent coffee grounds biorefinery. *Journal of Cleaner Production*, 211, 1553–1566. <https://doi.org/10.1016/J.JCLEPRO.2018.11.230>

## A. Appendices

### A.1 Informed Consent Form Template

Consent to Participate in a Research on Café Usage and Coffee Waste Management

I, \_\_\_\_\_, have been clearly informed on the purpose and procedures of the research led by Emma Prost at Aalto University School of Arts, Design and Architecture, Espoo, Bachelor's Program in Design, and have shown interest in participating in the studies developed by the student cited above. I am aware of and understand the contents of the research and how my participation will occur.

This research includes

interview

other field works (specify)

I agree to participate

I do not agree to participate

\_\_\_/\_\_\_/\_\_\_ \_\_\_\_\_ Date and Place

\_\_\_\_\_ Name of the Participant

\_\_\_\_\_ Signature of Participant

\_\_\_\_\_ Signature of Researcher

## A.2 Coffee Shop Interviews Guide

### *Introductory questions:*

- Who are you?
  - Where do you come from, age, and job position?
  - How did you end up working in/leading a coffee shop?
- Tell me about your job.
  - Could you describe a regular working day?
  - What are you responsible for? What are your main responsibilities?

### *Intermediate questions:*

- How would you describe your coffee shop, if you were to introduce it to someone? How does it stand out from other coffee shops?
  - How do you feel about the sustainable aspect of your coffee shop? How would position yourself concerning sustainability?
- What are you working on now? Do you have projects? What have you planned for the future?
  - What are the intended outcomes?
  - What are the reasons for this change?
  - How present is sustainability in your coffee shop's plans?
  - How do you plan to bring about these changes? (Stakeholders, actors, mediums)
  - What challenges might you encounter?
- How do you manage your waste/garbage?
  - What is your waste mainly composed of?
- How much spent coffee ground do you produce in a working day?
- How do you handle your spent coffee ground?
  - How do you dispose of it?
  - How do you feel about it?

### *Revealing questions:*

- Have you heard of the SCG recycling option?
  - If so, can you describe it to me?
- What do you think of this SCG recycling concept?
  - Would you consider it? Why?
- If someone came to you asking you to partner up by picking up your spent coffee ground, what would you reply?
  - If you were to accept, what would be the reasons for you to accept?

- If you were to refuse, what would be the reasons for you to refuse/end the partnership?
- What would your conditions be to accept this collaboration? (Frequency, money, equipment, communication, ...)
- What would this partnership mean to you?

*Concluding questions:*

- Is there anything you want to add, that you feel we should address?
- Do you have any more questions?

## A.3 Designer Interviews Guide

### *Introductory questions:*

- Can you tell me about yourself?
  - Where do you come from, age, and studies?
  - What is your relationship with coffee shops?
  - How did you end up liking coffee shops?

### *Intermediate questions:*

- What do you know so far about spent coffee grounds?
  - What about the disposal of spent coffee grounds?
- How is waste management enforced in coffee shops?
- How do you see waste management in coffee shops in the next 5 years?
- What approach would design have towards coffee shops' environmental sustainability?
- In your opinion, is it possible already to have a sustainable coffee shop today?

### *Revealing questions:*

- What motivators would there be for coffee shop managers to bring about a change in cafés?
- How should change be implemented in coffee shops?
  - How could SCG recycling be implemented in coffee shops?
- How could SCG recycling be promoted in coffee shops?

### *Concluding questions:*

- Is there anything you want to add, that you feel we should address?
  - Do you have people or places in mind, that you would like to recommend?
- Do you have any other questions?

## A.4 Summarized Coffee Shops Interviews Codebook

Code #	Code	Definition	Interview	Quotes
1	Coffee shop Identity	How CS interviewees describe their coffee shop to customers	CS interviewee 4	"It is a French bakery-pastry shop where you can enjoy a good coffee"
			CS interviewee 1	"I would describe it as your very social living room."
			CS interviewee 2	"I'm the owner of this cafeteria"
			CS interviewee 3	"We source coffee."
			CS interviewee 3	"What I believe is that what the customers don't know, we can educate them, and we can make them learn."
			CS interviewee 4	"Well, if I do it, I think I'll communicate about it. I will make a product anyway."
2	SCG recycling appreciation	The interest of coffee shops to give their SCG for recycling	CS interviewee 2	"I would accept it, of course, yeah."
			CS interviewee 3	"Absolutely, I think that's a brilliant idea. I mean, what happens now is just that we don't have any use for it. It goes into biogas production or whatever; the energy or the processing company deals with it. But if somebody would propose this, I would be happy to give it."
			CS interviewee 3	"If there was an offer, I would consider it. I haven't, I haven't thought about it."
			CS interviewee 1	"Yeah, I would 100% be down to explore that. Because I've worked in so many places, and so I know that Spent coffee grounds is an every-single-coffee-shop problem like it is a main source of waste. So, if there is any way to do that then for sure."
			CS interviewee 4	"And why don't they canvass these people then?"
3	SCG donation	CS interviewees implying to donate their SCG	CS interviewee 4	"I give them coffee grounds, we make them every day, it's not a problem."
			CS interviewee 2	"Well, it's a waste. Why try to get some extra gain for yourself, for like nothing? "

4	SCG collection	CS interviewees were not willing to deliver the SCG, expecting the collectors to come to pick up the SCG themselves	CS interviewee 2	"The companies who take the waste should make that step because they are basically the ones in need of that more than we are. Because let's say they are making shoes and growing mushrooms: That's beneficial for them. They get some money from that."
			CS interviewee 1	"Yeah, I think it's very simple. It's whoever wants to come to get the coffee grounds and just come get them."
			CS interviewee 1	"Having to move them to an external place can be a bit difficult. It also does add more time to our work day, so when we're done we're actually not done."
			CS interviewee 3	"As long as we didn't have to deliver."
5	Collection Equipment	CS interviewees expect the collectors to provide the coffee shop with collection equipment	CS interviewee 4	"They give us a convenient container and they come to pick up one twice a week"
			CS interviewee 4	"I think that for 10€ they get their stuff, right? And then something they pay once and that's it."
6	Convenience	CS interviewees aiming for a convenient collaboration	CS interviewee 4	"I don't want it to become a burden"
			CS interviewee 4	"I don't want it to cost me anything. Unless they pay me afterward. If they buy it from me that's another subject. But if it's going to cost me more for them, business-wise I can't do that."
			CS interviewee 4	"Win-win for everyone, I'm willing to do the work for them but I want something in exchange too."
			CS interviewee 3	"Because at the moment we really can't [deliver]."
7	Space constraints	The space would be dedicated to the SCG storage in the coffee shop.	CS interviewee 2	"So we are trying to use already every square meter for ourselves then, but if it would be like a daily thing, then no problem with that."
			CS interviewee 1	"At Kahiwa we would have the space to do that."
			CS interviewee 1	"I don't think most cafes will have the same opportunity because it's also a space issue. If they have the space to put this extra container to store the coffee grounds for a while."

			CS interviewee 1	"For us specifically, I could totally see it being an option. We do have weird dark corners that we can shove a basket in and leave coffee."
			CS interviewee 1	"But I know for a lot of other places, space might be the issue"
8	Staff constraints	The responsibility (or non-responsibility) of the staff regarding SCG collection	CS interviewee 1	"I think the biggest question mark is maybe not more so about the money. It's more so about the work that we're adding onto the employees. "
			CS interviewee 4	"I can't ask my staff to take it somewhere, they're not there for that."
			CS interviewee 1	"I think it does become a little bit more work and quite inconvenient or impossible maybe for cafe workers to bring the bio elsewhere."
9	Time constraints	CS interviewees mentioned Time when talking about SCG collection for SCG collectors.	CS interviewee 2	"I have too many things, too less hours in the day to spend the time for that. I have more other things where I have to put my mind, my energy, and my time, so that would not work for me. "
			CS interviewee 1	"Having to move them [SCG] to an external place can be a bit difficult. It also does add more time to our work day, so when we're done we're actually not done."
10	Awareness	The knowledge the interviewees have about SCG, coffee shops, their environmental impact, and SCG recycling	CS interviewee 2	"I would only imagine using it in the beauty industry. But making some other things, no I have not heard yet."
			CS interviewee 2	"Not really. I have never thought about it."
			CS interviewee 3	"I have heard, yeah. I've seen shoes. But I don't know how it works exactly"
			CS interviewee 1	"This sounds familiar I think"
			CS interviewee 4	"Now I admit that I don't really know what it means. Sustainability is basically that it lasts over time?"
			CS interviewee 4	"No, no strictly speaking no. I've heard before that it can be used for piping and stuff, so that's one way, it is the only thing I've heard."
11	SCG waste management	What the CS interviewees currently do with their SCG	CS interviewee 2	"Maybe 300- 400 grams." per week, scrubbing

			CS interviewee 3	"We tried different things but mainly at the moment we have it put in bio-waste."
			CS interviewee 1	"So, we have one bio that's specifically all coffee grounds. And then another for all the rest of food-related things and all those, but one of those is just specifically coffee grounds."
			CS interviewee 4	"We don't have bio waste here, so we put it the mixed waste"
12	Waste system	What waste rules do the SCG interviewees follow	CS interviewee 2	"Interviewer So the whole building has the same sorting system as you. Interviewee Yes, yes."
			CS interviewee 4	"Because we don't have the bio, quite simply. Here, we have not put it in place. I have to see with the Co-proprietorship, how it works exactly."
13	SCG waste amount	The amount of SCG produced by the coffee shops per working day	CS interviewee 2	"So roughly maybe 1, 1/2-kilogram kilo per day."
			CS interviewee 3	"About five kilos of coffee used per day."
			CS interviewee 1	"Our bags are 75-liter bags. On a weekend, I'm pretty sure we can fill ¾ of the way on a really busy weekend. Week-days, maybe not so much so I would say. Like 3 or 4 kilos of spent coffee grounds [per day]."
			CS interviewee 4	"Not even a kilo per day"

## A.5 Summarized Designer Interviews Codebook

Code #	Code	Definition	Interview	Quotes
1	Goodwill	Response to design interviewees about the coffee shops simply willing to donate their SCG	Design interviewee 3	"I just think that goodwill and like, <i>I'm just doing this for charity</i> , it just cannot last forever."
			Design interviewee 3	"I think it might come to a point where people will start like losing like touch with what they're actually doing and like making it in their head sort of like devaluing what they're doing because they don't see stuff happening, or something that proves that this is actually happening or that's why they cut corners?"
2	Advertising Identity	Proposing that coffee shops let their customers know about their collaboration and communicate about it.	Design interviewee 3	"Can also be a little bit advertising, like a mention."
			Design interviewee 3	"So yeah, I was thinking in mushroom growing and selling, there could be some way to have people know where things come from, and I think I would find it really cool to have in the mushroom package or something, like a mention of where it actually comes from. "
			Design interviewee 2	"The consumer already makes the choice how sustainable they wanna go"
3	Raising awareness	Design interviewees considering the importance of raising awareness and using it to promote the SCG recycling collaboration	Design interviewee 2	"I think coffee has this nice way of accessibility that in the small cafes, baristas are really educating people because they love to talk about it."
			Design interviewee 3	"I think maybe letting the people that come into the coffee shop know what you're doing with the waste it could be a motivator and people maybe would come more often or privilege certain places if they know."

			Design interviewee 3	"If I knew that this place is doing something that I support or I'm on board with and I think it's cool, it's a good thing to do and I like my values align. I think I will [choose to go to that place instead of another one]."
4	Personalization	Adapting the collaboration plan to the coffee shops	Design interviewee 1	The collaboration should be "Designed with them or provided to them as a framework that would really suit them. Their business model as well."
			Design interviewee 1	"Their drivers for implementing such a solution could be very different, you know."
			Design interviewee 1	"The implementation would have to be quite swift and easy for them to do so."
5	Gain	Gain as a motivator to canvass coffee shops in the SCG recycling collaboration	Design interviewee 1	"I would still say, consider the aspect of adding value."
			Design interviewee 3	"The first thing that comes to mind [is] maybe money?"
			Design interviewee 1	"Well, I mean first thing coming to my mind would be just simply the financial aspects of it."
			Design interviewee 3	"Maybe the waste disposal could be visible to the people. So, I was thinking, if the people see actually this transparent box or whatever, see it filled during the day. So like oh, "What's this actually?" or I think they could spark conversation."
			Design interviewee 3	It would lose the "there's no space for it" because I think when you say that it should be in the back or it should be someplace where people want to see."
6	Empathy	Empathizing with the coffee shops' situation and their needs	Design interviewee 1	"Because implementing any of those solutions would mean more work from someone's side."
			Design interviewee 1	"[Check] how easy it is for the coffee shop to implement. because like the reality is that if it's a big company, they have reduced their staff and they like are learning to make a profit. "
			Design interviewee 1	"Maybe they would have to do something specific with, for example, the coffee grounds, so that adds either to the work time, or there would need to be two people in the shift instead of one."

			Design interviewee 1	"You kind of have, for example, the whole service blueprint. So the coffee shop owners or managers know what is required from them. What are the actual action points? How that would fit into their daily or weekly schedule?"
7	Design interviewee's awareness	Interviewees' awareness about environmentally sustainable and SCG recycling sustainability	Design interviewee 2	"Interviewer: Do you know first of all that coffee beans are pretty unsustainable? Interviewee: Yes. Yeah."
			Design interviewee 2	"I think, as a coffee nerd, I like to read about it and stuff now in coffee, for me it's really easy to pay more for my beans because I know the impact of it and I read about it and it's kind of my hobby also. I see it also as a hobby."
			Design interviewee 3	"Reusing coffee grounds? No, not at all."
			Design interviewee 1	"I think that there are like great alternative solutions and like how to use the coffee grounds. You know like just stuff that is out there, but then there are already like solutions like for example growing like mushrooms"
			Design interviewee 1	"But like other than that, I feel like implementing more kind of for example, like a circular approach towards the coffee grounds, because like all the other elements or like for example, the cardboard, like it's easy to recycle, but the coffee grounds are something that you generate daily and that there are some uses how like they could be used, and so far they're just going to like landfill like it's like bio. So none of those places really try to implement any kind of more circular solutions for like this part of their waste."