A PEACEFUL FIGHT AGAINST FOOD WASTE IN AMSTERDAM

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MASTER'S THESIS

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MSc Industrial Ecology
June 2020

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A peaceful fight against food waste in Amsterdam: an explorative case study on the impact of food waste prevention initiatives

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“Measuring the impact is not about some technical figure, it is about signaling a problem and creating awareness. That is what matters." Menno, De Kaskantine

Acknowledgements

I would like to thank a number of people which have been of importance throughout this research project. Without their contribution and support my thesis would not have become what it is now. Firstly, I would like to thank Elise from Guerilla Kitchen, Menno from De Kaskantine, Benjamin from De Tweede Jeugd, Coby from Healthy & Affordable, Isabel from Taste Before You Waste and Jurjen from Too Good To Go. I want to thank them for taking the time to sit down with me and discuss their personal experiences in their efforts to prevent food waste. It was exciting to hear their stories and see how passionate they are to prevent food waste. Amsterdam is lucky to have you.

I would also like to thank my supervisors Jaco Quist and Jotte de Koning for their support during this research project. Their academic insights and critical eye helped me to get a sense of direction. My special thanks goes to Jaco for our insightful conversations on food waste prevention initiatives and his tireless enthusiasm.

Lastly, I want to thank Pauline Schijf for her continuous support and patience during this research project.

I wish you a pleasant and thought-provoking reading experience

Summary

Food waste is a global problem that has a significant impact on the environment and society. Nevertheless, the Dutch government lacks a clear strategy to reduce food waste. The city of Amsterdam also lacks such a strategy. Therefore, various social innovation (SI) initiatives are actively preventing food waste. These initiatives emerge from local collaboration and address a social problem in society that existing institutions have failed to tackle themselves. These initiatives call themselves “signaleringskeukens" or food waste prevention initiatives. As there is a lack of knowledge on the impact and governance of food waste prevention initiatives, this thesis aims to answer the following research question: *What is the impact of food waste prevention initiatives in Amsterdam?* In doing so, it will look at the governance of food waste prevention initiatives, their environmental and socio-economic impact, and drivers and barriers that influence this impact.

To analyze the impact, governance, and drivers and barriers of food waste prevention initiatives, this thesis examines each case using a conceptual framework following the Transformative Social Innovation theory. This theory argues that SI initiatives, such as food waste prevention initiatives, can drive systemic change. In doing so, this thesis analyzes the different ways of organizing, doing, framing, and knowing of initiatives.

The study shows that the initiatives have similar goals regarding food waste prevention, but introduced various new organizational structures and activities to do so. However, the initiatives mainly work individually and therefore fail to share their expertise and resources among themselves. Furthermore, the study finds that the initiatives face various barriers in their

efforts to prevent food waste. The main barriers concern a lack of money, trained volunteers, appreciation, urgency, and knowledge among policymakers, businesses, and households. Sustaining motivation to overcome these barriers is, therefore, the most critical driver.

The study shows that food waste prevention initiatives collectively saved approximately 214,000 kg of food in 2019, which translates to 530,000 kg of CO_2-eq. emissions. This amount of food waste equates to a share of 0.02% of the total amount of commercial food waste in Amsterdam, and 0.0003% of the total amount of food waste in Amsterdam, about 75,000 tonnes. Regarding their socio-economic impact, most initiatives raise awareness through the collection of food, their website, and social media channels. In doing so, the initiatives mainly pay attention to food waste in general and ways to prevent food waste. However, a small number of initiatives also focus on the activation of people to build their capacity to prevent food waste and stimulate social interaction through dinners. Concerning the economic impact, commercial initiatives mainly contribute to the local economy in terms of employees, whereas the non-commercial initiatives contribute to the affordability of food.

To conclude, food waste prevention initiatives currently lack the transformative power to realize system innovation. This lack of transformative power is induced by the fact that most initiatives work individually, do not engage in politics, and have no networks within the municipality or government. In combination with a lack of urgency and knowledge among policymakers and food businesses, this makes the initiatives powerless in their efforts to realize systemic change. Therefore this thesis recommends that food waste prevention initiatives establish strong networks with each other and the municipality to increase their transformative capacity. Furthermore, it recommends that the municipality starts a food waste taskforce and sets up a digital service point to facilitate food waste prevention initiatives.

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Chapter 1: Introduction

In 2018, the Dutch government set out the ambition to become one of the frontrunners in food waste reduction (Taskforce Circular Economy in Food, 2018). In correspondence with Sustainable Development Goal 12.3 (United Nations, 2015), the Dutch government aims to reduce its food waste per capita by half in 2030. Earlier, in the period between 2009 and 2015, the Dutch government aimed to reduce the amount of food waste by 20%. However, despite raising more awareness around food waste, the Dutch government did not realize a significant reduction (Taskforce Circular Economy in Food, 2018). Globally the amount of food waste has increased over the last decades, and it is estimated that one-third of the food production, around 1.3 million tonnes per year, is wasted annually (Priefer, Jörissen, & Bräutigam, 2016). As figure 1 illustrates, consumers and producers are the most significant contributors to food waste. In 2015, the Netherlands produced between 1.7 and 2.5 billion tonnes of food waste, which converts to 105kg and 152kg per capita (Taskforce Circular Economy in Food, 2018).

Regardless of being consumed or wasted, food production has a significant impact on the environment (Priefer, Jörissen, &

Bräutigam, 2016). The Food and Agriculture Organization (FAO) estimates that the amount of food waste equals 0.9 million hectares of land, 306km3 of water, and 3.49 Gt CO_2-eq. Consequently, food waste Moreover, if global food waste is considered a country, it would be the third-largest emitting country after China and the US (FAO, 2013). In addition to emitting greenhouse gases, food waste also contributes to unnecessary water stress and biodiversity loss.

Figure 1: Food waste in the food supply chain.
Source: Instock (2019)

Despite the considerable environmental impact of food waste and the ambitious goals set out by the Dutch government, a clear policy focussed on food waste prevention is still missing (Taskforce Circular Economy in Food, 2018). Moreover, while the Dutch government struggles with food waste prevention, food waste prevention initiatives take action themselves. These food waste prevention initiatives call themselves a “signalerings-keuken”, which are bottom-up initiatives that observe a problem in society that they refuse to accept any longer. Hence they take action to address this problem. Not only as an individual but also as a group, organization, and network. With their actions, they want to give people the right example and hope to raise

and hope to raise awareness of the problem. This concept interacts with the theoretical concepts of 'social innovation' and 'food sharing'.

1.1 Problem statement

The Dutch government and the municipality of Amsterdam both lack a clear strategy to tackle food waste problems. In addition to the vast number of food waste prevention initiatives (Davies et al., 2016; Meischke, 2018; Michon, 2019), Amsterdam provides an excellent example of how food waste prevention initiatives have taken the lead in preventing food waste. In the past ten years, many different food waste prevention initiatives arose. These initiatives sharply differ concerning their organizational structure and area of expertise. Some are only active in Amsterdam or nationwide, while others have physical locations or are only active online. However, all food waste prevention initiatives have similar goals, which is to eradicate food waste. Food waste prevention initiatives predominantly do that by collecting unsold and leftover products from supermarkets and the catering industry (restaurants, bars, and grocers). As figure 1 shows, this accounts for almost 20% of all food waste. Instead of letting this food go to waste, food waste prevention initiatives redistribute this food waste through various activities such as gifting, selling, cooking, and producing.

As chapter 2 will show, there is a lot of information and knowledge at hand regarding the concepts of social innovation and food sharing. However, it also identified two critical research gaps. Firstly, academic literature has shown that more knowledge on how to govern these food waste prevention initiatives is valuable to increase their impact (BEPA, 2010; Chalmers, 2012; European Commission, 2016; Wolfram, 2018;

Davies, 2019). Secondly, Davies (2019) shows that the impact of food waste prevention initiatives remains unknown. With the publication of her book *Urban food sharing: Rules, tools and networks,* Davies made a start by mapping food sharing initiatives in 100 urban areas, including Amsterdam. However, there is no information on the impact these initiatives have on their cities' food systems. With her book, Davies underlines that there is a severe knowledge gap considering this impact. In sum, the two main identified research gaps are measuring the impact of food waste prevention initiatives and how to govern these initiatives. Both are interrelated as better governance of social innovation (SI) initiatives initiatives can lead to better monitoring and vice versa.

Amsterdam's situation is no exception since it also remains unknown what the impact is of food waste prevention initiatives. Coudard (2019) made a start by qualitatively scoring food waste prevention initiatives, but recommends that future research is necessary to measure the exact impact of these initiatives in Amsterdam. This thesis aims to fill this gap by making a start in measuring the environmental and socio-economic impact of food waste prevention initiatives in Amsterdam in more detail.

1.2 Research goals and questions

The fact that a diverse mix of food waste prevention initiatives is active in Amsterdam makes it a compelling case. However, the impact of food waste prevention initiatives remains unknown. Based on the research gaps identified in section 1.2, this research aims to answer the following question: *What is the impact of food waste prevention initiatives in Amsterdam?* Apart from their impact, the research will also look into the daily practices of food waste prevention initiatives to prevent food waste. Additionally,

the research will also study the drivers and barriers experienced by these initiatives. In doing so, this thesis also aims to provide insights into the governance of food waste prevention initiatives.

The research goals that can be linked to this question are:

1. Provide insights in how to govern food waste prevention initiatives.
2. Estimate the current environmental and socio-economic impact of food waste prevention initiatives in Amsterdam.
3. Provide insights in the drivers and barriers behind food waste prevention initiatives.

In order to answer the main research question, the following sub-questions will have to be answered in advance:

1. What are the daily practices of food waste prevention initiatives?
2. How do drivers and barriers faced by food waste prevention initiatives exert influence over the upscaling of their activities?
3. What is the current environmental impact of food waste prevention initiatives?
4. What is the current socio-economic impact of food waste prevention initiatives?
5. To what extent can the activities of food waste prevention initiatives be considered as transformative?

1.3 Scope and boundaries

According to Davies (2019), Amsterdam is the city with the most food waste prevention initiatives in the Netherlands. Therefore the scope of this thesis is limited to Amsterdam. Apart from being active in Amsterdam, food waste prevention initiatives need to engage in the collection and redistribution of leftover

food from distribution centers, supermarkets, grocers, and the catering industry since this is the main strategy to prevent food waste. The research uses a multiple case study design wherein each food waste prevention initiative is considered a case. In order to analyze the impact of food waste prevention initiatives, the research uses a qualitative approach with semi-structured in-depth interviews.

1.4 Readers' guide

In the following chapters this thesis will answer all research questions. Starting with Chapter 2, which will review all relevant theoretical concepts that touch upon the actions of food waste prevention initiatives. Following chapter 2, chapter 3 discusses the methodology used to answer the research questions systematically. Chapter 4 contains all empirical findings from all individual cases, which are compared with each other using a cross-case comparison in chapter 5. The cross-case comparison is followed by the discussion in chapter 6, which discusses the limitations, implications, and novelty of the results. Lastly, this thesis concludes with chapter 7 wherein the conclusions and recommendations are presented.

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Chapter 2: Literature review

Food waste prevention initiatives touch upon two core theoretical concepts: social innovation and food sharing. This chapter will discuss and elaborate upon these core theoretical concepts. In section 2.1 the process of defining social innovation is illustrated, followed by section 2.2, that discusses the concept of food sharing and illustrates a typical food supply chain. Section 2.3 discusses the main drivers and barriers for SI initiatives.

2.1 Social innovation

The following question guides this section: What is social innovation? The section starts with a short introduction to the concept of social innovation, after which it outlines the various dimensions and conceptualizations. The selection of papers follows the methodology proposed by van Wee and Bannister (2016), which is explicit about the sourcing of useful publications. The search for relevant papers started using SCOPUS searching for "social innovation" in 'Article Title, Abstract, Keywords' and only selecting the subject areas 'social sciences' AND/OR 'environmental science'. This search led to

1.503 results in which author F. Moulaert featured in 16 documents and accounted for a total of 1.312 citations. His most relevant work for this thesis was his second-highest cited document with 258 citations. The database of Google Scholar was also used for finding relevant literature. Searching for "social innovation" in the Google Scholar database led to finding relevant papers from Mulgan et al. (2007), Phills, Deiglmeier and Miller (2008) and Murray, Caulier-Grice & Mulgan (2010) with 1377, 1475 and 1327 citations respectively. Using these publications as a starting point, the method of backward snowballing, the identification of relevant articles in the reference list, was used (van Wee & Bannister, 2016). Lastly, some articles were retrieved from personal communication with supervisors. The search for relevant papers was limited by the indicative threshold set by van Wee and Bannister (2016), who set the minimum amount of papers for a literature review on 30 papers. However, this limitation does not mean that all 30 papers on social innovation are used in this chapter.

Before diving into the concept of social innovation, it is important to define the terms 'innovation' and 'social value'. The academic literature defines the concept of innovation in various ways. According to Phills, Deiglmeier and Miller (2008), for something to be considered an innovation, the process or outcome needs to be new for the user, context, or application. Furthermore, it needs to be an improvement compared to existing alternatives, e.g., more efficient or effective. In other words, it needs to be an idea that is or can be successfully commercialized (Dziallas & Blind, 2019). Mulgan et al. (2007: 8) keep it more straightforward and define innovation as "new ideas that work", moving away from the idea that innovation needs to be an improvement. They argue that the term improvement only looks at incremental change and ignores the

importance of diffusion and implementation of innovations, which eventually transforms ideas that look promising into ideas that work and meet their goals. Bureau of Policy Advisors (BEPA) (2010: 33) integrates both interpretations of innovation and refers to innovation as "the capacity to create and implement novel ideas which are proven to deliver value". This definition takes creativity and novelty into account, as well as the implementation of these ideas. In short: innovation means an improvement of the current situation and ideas that work in practice. However, it does not remain easy to consider something to be an improvement. In order to do so, it needs clear indicators to measure this. These indicators will be more elaborated upon in chapter 3.

The term 'social value' is less defined in the literature. Phills, Deiglmeier, and Miller (2008: 39) define social value as "the creation of benefits or reductions of costs for society–through efforts to address social needs and problems–in ways that go beyond the private gains and general benefits of market activity." In this context, one could argue that entrepreneurs are generally motivated by money, while altruism drives social entrepreneurs (Martin & Osberg, 2007). Lastly, Brandsen et al. (2016) argue that the term 'social' in social innovation is often related to improvement. Based on the various literature on social value, it is possible to define the 'social' component as an improvement beyond private or market-related benefits, that addresses a social problem. Alternatively, as BEPA (2010: 33) defines it, the creation of "a value that is less concerned with profit and more with issues such as quality of life, solidarity and well-being". This thesis will use the latter definition since it corresponds to the activities and motivation of food waste prevention initiatives. Nonetheless, it should be noted that there is a continuous

academic discussion on the meaning of the term ‘social’. This discussion is, however, not the focus of this thesis.

Social innovation: the emergence of a concept

The emergence of the concept of social innovation can be traced back to the 18th century and has been around since then (Moulaert, 2009). After a period of little attention, the concept of social innovation has been getting significant attention in the academic world since the late ’90s. The attention for the concept increased because existing institutions continued to struggle with the biggest challenges of the 20th and 21st century, such as climate change and inequality (Murray, Caulier-Grice & Mulgan, 2010). During that period, the terms 'corporate citizenship' and 'socially responsible businesses' have also grown substantially, integrating the word ‘social’ into their activities (Phills, Deiglmeier and Miller, 2008). This has produced terms as *social entrepreneurship* and *social enterprise*. Especially the concept of social innovation is subject to continuous academic debate over its exact meaning. This discussion has led to a plethora of definitions in the academic field (Nicholls, 2006; Mulgan et al., 2007; Phills, Deiglmeier and Miller, 2008; Moulaert, 2009; BEPA, 2010; Murray, Caulier-Grice & Mulgan, 2010; Chalmers, 2012; Li, Sun & Lin, 2012; Oliveira & Breda-Vazquez, 2012; Oeij, Dhondt & Korver, 2012; Nicholls, Simon & Gabriel, 2015; Brandsen et al., 2016; Hoppe & de Vries, 2018; Oeij, van der Torre & Dhondt, 2019). Table 2.1 gives an overview of various conceptualizations of social innovation. These definitions act as guidance to illustrate the general discussion on the meaning of social innovation. It will look for similarities and discrepancies in order to substantiate what this thesis defines as social innovation.

Table 2.1: Overview definitions social innovation. Source: author

Authors	Definition
Social innovations are...	
BEPA, 2010: 33; Murray, Caulier-Grice & Mulgan (2010: 3)	"innovations that are social in both their ends and their means"
Brandsen et al. (2016: 6-7)	"created mainly by networks and joint action in social realms beyond business and government routines, at any given moment, raise the hope and expectations of progress towards something "better" (a more socially sustainable/democratic/effective society)"
Chalmers (2012: 19)	"New ideas (products, services and models) that simultaneously meet social needs and create new social relationships or collaborations. In other words, they are innovations that are both good for society and enhance society's capacity to act'"
Haxeltine et al. (2017: 3)	"process of challenging, altering, or replacing the dominance of existing institutions in a specific social and material context"
Li, Sun & Lin (2012: 58)	"Social innovation concerns the developmental change of the productive and reproductive relationships of "social actors" on the constitutional, conditional and normative level of daily life."
Mulgan et al. (2007: 8)	"Innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purposes are social"
Moulaert (2009: 12)	"It defines social innovation as the satisfaction of alienated human needs through the transformation of social relations: transformations which 'improve' the governance systems that guide and regulate the allocation of goods and services meant to satisfy those needs, and which establish new governance structures and organizations (discussion fora, political decision-making systems, firms, interfaces, allocation systems, and so on)."
Oeij, van der Torre & Dhondt (2019: 244)	"The invention, development and implementation of new ideas to solve social problems faced by individuals, groups or communities."
Oliveira & Breda-Vazquez (2012:522)	"Social innovation, therefore, meaning the application of creativity to social purposes, is often presented as an alternative concept
Phills, Deiglmeier & Miller (2008: 36)	"A novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals"
Wolfram (2018: 13)	"However, the core motive remains to solve problems of unmet social needs and to improve living conditions where state and market actors do not provide satisfactory solutions."

Defining social innovation

As discussed above, the concept of social innovation is challenging to grasp. There are many different ways to conceptualize social innovation, which makes it a concept that is difficult to capture in one tight definition. On the one hand, social innovation is defined too general, while on the other hand, it is defined too narrow (Murray, Caulier-Grice & Mulgan, 2010). Oeij, Dhondt and Korver (2012) underline this and conclude that the concept does not have a homogenous meaning. Building on this research, Li, Sun and Lin (2012: 57) argue that the social innovation concept in current research "appears to cover everything, but indeed it covers nothing". Considering there is a broad range of definitions and interpretations of the concept, Brandsen et al. (2016) conclude that defining social innovation is a process that is continuously undergoing change and something that should always be approached critically.

That said, the idea behind this section is to define social innovation in the context of food waste. By using the most cited authors and their definitions in table 2.1 as a starting point, this sub-section eventually arrives at what this research defines as social innovation. However, before diving into the different definitions, it is essential to note that the concept of social innovation is perceived as multi-dimensional (Moulaert et al., 2005; Moulaert et al., 2009 in Li, Sun and Lin, 2012; BEPA, 2010). Moulaert et al. (2005: 1976) describe the three dimensions as the following: 1) The content dimension, which concerns "the satisfaction of human needs that are currently not satisfied" mainly because neither the market or state gives priority to these needs and consider them as irrelevant; 2) The process dimension, concerning "changes in social relations that enable the above satisfaction" aiming to increase the level of

participation across all groups in society; 3) Lastly, the empowerment dimension, which concerns "increasing the socio-political capability and access to resources" for people to empower themselves, satisfy their needs and increase their participation. In the eyes of Moulaert et al. (2005), social innovation is thus about inclusivity and justice.

In correspondence with Moulaert et al. (2005), Nicholls, Simon and Gabriel (2015) identify three levels of social innovation (see table 2.2). First, there is incremental innovation that aims to tackle social problems more effectively or efficiently. It mainly concerns goods and services and is, to put it bluntly, a business opportunity since the market and government have failed to tackle the problems satisfactorily.

Table 2.2: Three levels of social innovation. Source: Nicholls, Simon & Gabriel (2015)

Level	Objective	Focus	Examples
Incremental	To address identified market failures more effectively	Products	Charities and not for profit organizations
Institutional	To reconfigure existing market structures and patterns	Markets	Fairtrade
Disruptive	To change cognitive frames of reference to alter social systems and structures	Politics	Human rights organisations or political parties

Secondly, institutional innovation primarily focuses on changing existing market structures for the benefit of creating social value. Lastly, disruptive innovation is all about systems change, for the

benefit of deprived social groups, through social movements and networks that aim to change the existing social hierarchy and corresponding power relations. These three levels correspond with the three dimensions Moulaert et al. (2005), wherein the first dimension relates to market failures and thus an incremental innovation. The second dimension is about changing social relations, which relates to institutional innovation. Lastly, the third dimension is about empowerment, which relates to the level of disruptive innovation, focussing on systems change through politics.

Considering the definitions of social innovation, one of the most cited definitions of social innovation is from Phills, Deiglmeier & Miller (2008: 36) who define social innovation as "A novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals". Compared to the work of Moulaert et al. (2005) this definition is primarily focused on innovation but takes inclusivity and justice into account. Brandsen et al. (2016) criticize this definition because it is too general, which makes that many innovations can be qualified as social innovation. Brandsen et al. (2016: 6-7) therefore define social innovation as something that "are created mainly by networks and joint action in social realms beyond business and government routines, at any given moment, raise the hope and expectations of progress towards something "better" (a more socially sustainable/ democratic/effective society)". SI initiatives thus provide a solution to a problem that state and market have failed to tackle adequately (Wolfram, 2016; Moulaert, MacCallum & Hillier, 2013). Both definitions correspond with the first level of innovation since they both strive to address a social problem caused by market failure. However, in contrast to the former, the

definition of Brandsen et al. (2016) makes a clear distinction between the realm of state/market on the one hand and the realm of social networks on the other. Following this distinction, they conclude that SI initiatives are organized and initiated beyond the state and market's traditional working areas.

Another widely cited definition is phrased by BEPA (2010) and is considered to be more concise (Murray, Caulier-Grice & Mulgan, 2010; Oeij, Dhondt & Korver, 2012; Chalmers, 2013; Nicholls, Simon & Gabriel, 2015; Hoppe & de Vries, 2018). It states that social innovation "are innovations that are social in both their ends and their means" (BEPA, 2010: 33; Murray, Caulier-Grice & Mulgan, 2010: 3). In more detail, they mean that social innovations are new ideas that can be either products, services or models "that simultaneously meet social needs and create new social relationships or collaborations" (Ibid.). In light of this definition, social innovation aims to achieve two things: 1) it aims to find better ways to meet the social needs of society and thus provide a solution to a problem that lies in society; 2) in order to achieve this, it aims to generate new social relationships by creating more commitment and solidarity among these newly organized relationships (Oeij, Dhondt & Korver, 2012; Nicholls, Simon & Gabriel, 2015). Following this definition, it also becomes clear what SI initiatives distinguish from governments and markets: social goals have the primary focus and emerge from a more organic and local collaboration (Oeij, Dhondt & Korver, 2012; Brandsen et al., 2016). This outcome corresponds with the concept of grassroots innovation, and one could even argue that grassroots innovations are also a form of social innovation (Wolfram, 2016). Like social innovation, grassroots innovations also have a strong focus on social problems (Seyfang & Smith, 2007; Martin & Upham, 2016; Wolfram, 2016). Grassroots innovations take the local context, values, and interests of all

involved stakeholders, such as communities, into account and try to develop new bottom-up solutions. These solutions emerge from local networks between activists and organizations. Especially in cities, urban grassroots innovation focuses primarily on energy, water, construction, and, interestingly, food (Wolfram, 2016).

Another frequently cited definition is from Mulgan et al. (2007: 8), whom define social innovation as "Innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organizations whose primary purposes are social". The definition by Mulgan et al. (2007) combines the main points of all the definitions mentioned above: it addresses a social need that market and state have failed to tackle, is both social in their means and end, and is diffused through organizations that are driven by social goals. However, in contrast to Brandsen et al. (2016), BEPA (2010) and Murray, Caulier-Grice, and Mulgan (2010), they remain neutral on how these innovative activities and services emerge. Furthermore, this definition moves away from the previously made distinction between state, market, and other organizations, which means that there is room for organizations that have a primary focus on addressing a social need, but that are also business-oriented. This phenomenon could also be described as social entrepreneurship. Nicholls, Simon & Gabriel (2015) also argue that social innovation could also be considered in the context of a more business-oriented field called social entrepreneurship. Social entrepreneurship has gained significant attention over the past 15 years (Bozhikin, Macke & da Costa, 2019). Building on the discussion above, social entrepreneurship can be defined as "Innovative and effective activities that focus strategically on resolving social market failures and creating new opportunities to add social value

systemically by using a range of resources and organizational formats to maximize social impact and bring about change." (Nicholls, 2006: 23). In this definition, social entrepreneurs act as agents of change through, among other things, sustaining social value, recognizing new opportunities, and continuous innovation. Thus, social entrepreneurs seek new combinations of products, services, organization, and production (Phillips et al., 2015). Based on the argument of Dziallas and Blind (2019), it is possible to argue that the term social takes out the commercialization part of the concept of innovation. Social enterprises are merely the vehicle in which social entrepreneurs can develop innovation, which combines social and economic value creation (Phills, Deiglmeier, and Miller, 2008). In short, one could argue that both social innovation and social entrepreneurship strive for the same thing and that it is possible to combine social and economic goals (Phillips et al., 2015).

Lastly, the definitions mentioned above are primarily focused on products and markets, and do not necessarily focus on the third dimension and level, which is about systemic change and disruptive innovation. The concept that is more focused on this level is called Transformative Social Innovation (TSI) and is introduced by Haxeltine et al. (2017: 3) who define social innovation as the "process of challenging, altering, or replacing the dominance of existing institutions in a specific social and material context" (Haxeltine et al., 2017: 3). In this process, SI initiatives are considered to be the key drivers behind initiating such a process (Haxeltine et al., 2017). In other words, one could say that TSI is the process wherein SI initiatives aim to tackle social problems for the benefit of society and contribute to societal transformation. This transformative capacity is especially relevant for studying the impact of SI initiatives.

Therefore chapter 3 will elaborate more upon this theory and its relevance to the purposes of this thesis.

Final definition social innovation

The discussion above shows that there is a broad range of interpretations of what the concept of social innovation entails. It is a multi-dimensional concept with different levels of focus. In sum, there is no right or wrong definition of social innovation. However, based on the arguments presented above, it is possible to conclude that most authors find common ground in the following elements of social innovation. First of all, SI initiatives often emerge bottom-up from local collaboration (Oeij, Dhondt & Korver, 2012; Brandsen et al., 2016; Wolfram, 2016). Secondly, it addresses social problems in society which have not yet been satisfactorily tackled by the existing institutions (Nicholls, 2006; Mulgan et al., 2007; Phills, Deiglmeier and Miller, 2008; Moulaert, 2009; BEPA, 2010; Murray, Caulier-Grice & Mulgan, 2010; Chalmers, 2012; Nicholls, Simon & Gabriel, 2015; Brandsen et al., 2016). Thirdly, in doing so, SI initiatives introduce new ideas, products, and services (Mulgan et al., 2007; Phills, Deiglmeier and Miller, 2008; Moulaert, 2009; BEPA, 2010; Murray, Caulier-Grice & Mulgan, 2010; Chalmers, 2012; Oliveira & Breda-Vazquez, 2012; Brandsen et al., 2016; Oeij, van der Torre & Dhondt, 2019). Lastly, SI initiatives are social in their means and end (Murray, Caulier-Grice & Mulgan, 2010; BEPA, 2011; Oeij, Dhondt & Korver, 2012; Chalmers, 2013; Nicholls, Simon & Gabriel, 2015; Hoppe & de Vries, 2018). These four elements make up the definition of SI initiatives that this thesis considers as the most comprehensive definition.

2.2 Food sharing

This section will give insights into the current food supply chain and what is considered food sharing. The question guiding this section is: What does food sharing entail in an urban context? Answering this question will eventually lead to what this thesis considers as food sharing. The selection of papers follows the methodology proposed by van Wee and Bannister (2016) concerning the sourcing of useful publications. The search for relevant papers started using SCOPUS, searching for "urban food sharing" in 'Article Title, Abstract, Keywords'. This led to 9 results in which author A. Davies featured in 5 documents, of which her most relevant work for this thesis was the highest cited document with 19 citations. Another search was "food supply chain" in 'Article Title, Abstract, Keywords', which led to 2.709 results and the work of Parfitt, Barthel and MacNaughton (2010) as the most cited publication with 859. With these publications as a starting point, the method of backward snowballing was used. Since it is a relatively young field in the academic world, the publications are not older than 2017 and were not frequently cited. This limits the possibilities to reach the indicative threshold set by van Wee and Bannister (2016), who set the minimum amount of papers for a literature review on 30 papers. Furthermore, it is a field that lacks an academic discussion, which is underlined by the fact that publications are not frequently cited, especially compared to the field of social innovation. This section starts with a short introduction into the food supply chain and some of the main reasons behind food waste. Furthermore, this section discusses strategies for businesses to address these issues, followed by outlining what food sharing entails, especially in an urban context. Lastly, this section will examine how to govern food sharing and barriers related explicitly to food sharing.

Food waste supply chain

Priefer, Jörissen, & Bräutigam (2016) distinguish the following stages in the food supply chain: agricultural production, manufacturing, distribution and wholesale/retail, hospitality industry, and catering households (see also table 2.3). In the agricultural production stage, the food is cultivated and harvested (Parfitt, Barthel and MacNaughton, 2010). Followed by the manufacturing stage wherein the food is processed and packaged. The process stage concerns a variety of activities such as cleaning, grinding, drying, mixing, cooking, frying, and packaging of food. The distribution stage includes the transport, marketing, and storage of food. Lastly, the food is consumed in the hospitality industry and catering and household stage.

When discarding food, Parfitt, Barthel and MacNaughton (2010) distinghuish 'food losses' and 'food waste'. The former takes place in the earlier stages of the food supply chain, such as cultivation, harvesting, and treatment. The latter takes place in the later stages of the food supply chain, such as distribution, catering, and consumption. Based on this distinction, food waste can be defined as food that "was originally dedicated to human consumption, but is removed from the supply chain" (Ibid.: 156). An overview of the main reasons for wastage in these stages is in table X. Something these stages have in common is that they are often highly influenced by behavior (Parfitt, Barthel and MacNaughton, 2010). For instance, overstocking due to inaccurate forecasting of the demand for food in supermarkets or restaurants can happen through unexpected changes in behavior.

Table 2.3: Causes for food wastage in distribution and wholesale/ retail stage. Source: Priefer, Jörissen, & Bräutigam (2016).

Stages of the chain	Main reasons
Distribution and wholesale/retail	• Lack of cold storage/interruption of the cold chain • Packaging defects resulting in product damage • Overstocking due to inaccurate ordering and forecasting demand • Obligation for retailers to order a wide range of products and brands from the same producer in order to get beneficial prices • Failure to comply with minimum food safety standards (e.g. microbial contamination, pesticide residues) • Marketing strategies like 'buy one get one free'
Hospitality industry and catering	• Oversized dishes • Offer of buffets at fixed prices encouraging people to take more than they can eat • Use of individual portion packs (e.g. for jams, cereals, juice and milk) that do not meet the customer's needs • Difficulties in assessing the demand (number of customers) • EU hygiene rules, e.g. two-hour guarantee on unrefrigerated products

Food waste reduction strategies focus on raising awareness, providing information, forging partnerships, training and workshops, research, and the redistribution of food (European Commission, 2016). Especially the redistribution of food has been successful (European Commission, 2016; Priefer, Jörissen, & Bräutigam, 2016). This success correlates with the food waste reduction strategies in the distribution and wholesale/retail sector, mainly focusing on donations of edible food (Zimmerman, 2017). Other strategies in these sectors are using inedible food as animal-stock feed, in-store repurposing, stock rotation, and price reductions. For the hospitality sector, the most essential food waste reduction strategies are the use of advanced tools for forecasting the food demand, monitoring food waste data, training to improve the handling of food, and offering portion sizes that meet the needs of customers (Priefer, Jörissen, & Bräutigam, 2016).

The concept of Food sharing

As said, the redistribution of food is the primary strategy of food waste prevention initiatives. This strategy is a way to share food. This sub-section will outline what food sharing entails, especially in an urban context. Furthermore, it will look at how to govern food sharing and its barriers. In doing so, this sub-section aims to

define what this thesis considers as a food waste prevention initiative and what not.

Table 2.4: Typology food sharing. Source: adapted from Davies (2019)

What is shared?	Collecting	Gifting	Bartering	Selling (Not-for-profit)	Selling (For-profit)
Stuff	Sharing food that has been 'liberated', foraged or gleaned	Providing food for free	Swapping food and food devices	Providing affordable food on a not-for- profit basis	Selling home cooked food that generates income beyond the costs of production
Spaces	Guerrilla gardening of public open spaces	Providing spaces for growing or eating for free	Providing spaces where food can be exchanged for labour	Providing spaces for people to grow food on a not-for-profit basis	Providing spaces for supper clubs or dining experiences
Skills	Identifying places where gleaning or foraging might occur	Providing skills around growing for free	Providing opportunities to learn about growing food, swap seeds and produce	Providing workshops around nutrition or growing	Providing opportunities for travellers to experience home cooked meals with locals

Food sharing has been a cornerstone of human life from the start. However, regardless of its importance in shaping human life, it has received little attention from the academic world. However, in the last decades, the idea of sharing has changed due to the arrival of new information and communication technologies (ICT). ICT has made it easier for people to connect and exchange knowledge and skills, experiences, goods, and

services. The sharing of food has been no exception in this development. Davies (2019: 6) uses the dictionary definition of sharing and places this definition in the context of food: "having a portion [of food] with another or others; giving a portion [of food] to others; using, occupying or enjoying food [and food related spaces to include the growing, cooking and/or eating of food] jointly; possessing an interest in food in common; or telling someone about food." Essentially, this definition entails all activities one could do together with food (Davies et al., 2017). It allows for sharing many different types of food such as *stuff* (e.g. raw food materials such as seeds or compost and products such as processed food to eat or utensils), *skills* (e.g. teaching people how to grow, cook and discard food) and *spaces* (e.g. gardens, kitchens and eating spaces). Furthermore, Davies (2019) distinguishes four modes to share food: collection, gifting, bartering, and selling. Davies distinguishes two types of selling: for-profit and not-for-profit. Whereas the other modes of sharing speak for itself, the mode of collection needs some elaboration. This mode of food sharing entails the gleaning, dumpster diving, and foraging of food. The gleaning of food is the collection of leftover food from farmers, retailers, and supermarkets. Table 2.4 illustrates the different types and modes of food sharing. Using this typology, sharing something related to food already counts as food sharing. It is impossible to research all activities related to food sharing. Therefore, chapter 3 will discuss the scope and boundaries of this thesis.

2.3 Drivers and barriers of SI initiatives

Barriers to creating frameworks or directives to support SI initiatives are often related to financing, politics, laws and regulations, culture, lack of knowledge and skills, and lack of data (BEPA, 2010; Chalmers, 2012). This section will discuss how these barriers hamper the development of SI initiatives and explore the relationship between these barriers. Furthermore, this section will also discuss the main drivers behind SI initiatives.

Drivers

This sub-section will discuss the various drivers behind SI initiatives in general and food waste prevention initiatives

Structural conditions

One of the main drivers behind SI initiatives is structural conditions in terms of financial support (Schulmann et al., 2015). According to MacCallum (2013: 343) "the long term sustainability of SI initiatives is very often determined by resources (especially funding) from the state, as well as by regulatory environments that constrain or enable their operations". This means that regulatory frameworks and funding that provide long-term care are considered to be an essential driver. In other words, having an infrastructure in place that supports people with ideas, such as funding or supporting services, helps SI initiatives to translate their ideas into practice.

Technology

Schulman et al. (2015) also consider technology as a crucial driver behind SI initiatives. In terms of technology, ICT is mainly considered as the intellectual basis on which many services and products arise. New technologies, especially with regards to providing web-based information, could accelerate the development of SI initiatives.

Motivation

In contrast to Schulman et al. (2015), BEPA (2010) argues that the primary driver of SI initiatives is not technology. Instead, it argues that SI initiatives are mainly driven by societal problems embedded in society, such as social exclusion and unemployment. These problems drove important SI initiatives such as Greenpeace, the Red Cross, and Amnesty International to take action. It was the intrinsic motivation of the people behind these initiatives that drove them to tackle these issues and serve their communities.

Barriers

This sub-section will discuss the various barriers for SI initiatives in general and food waste prevention initiatives.

Financial barriers

As SI initiatives are often novel and bottom-up, the main barriers lie in financing and upscaling of activities (BEPA, 2011; Chalmers, 2012). SI initiatives initiatives usually start small and use non-traditional business models that are not always perceived as self-

sufficient. Consequently, they do not attract too much interest from investors for funding. Additionally, it is difficult for investors to estimate the value a social innovation initiative represents, mostly due to an insufficient focus on the social returns of the innovation. Historically, businesses mainly focus on technological innovations and economic returns, rather than social returns. This focus on technology can pose a barrier to SI initiatives because not every initiative will be able to afford new technologies. Apart from the focus on technology, there is also a lack of small funds for SI initiatives to apply (BEPA, 2010). This lack of funding creates a gap between good ideas and the development of these ideas into feasible innovations. Nevertheless, there are some grants available from charities, foundations, and other public organizations that SI initiatives can receive. However, even though such grants will help start-up the innovation, it will not be long-term funding, which is often necessary to grow the capital needed for expansion. In the long-term, this inability to grow hampers the development of SI initiatives. In short, SI initiatives need better access to funds, these funds need to focus on the long-term, and investors' focus needs to shift from economic returns to social returns.

Political/institutional barriers

Political barriers concern the coordination between SI initiatives and policies and the coordination between other players, such as similar SI initiatives or funding companies (BEPA, 2010; Chalmers, 2012). According to BEPA (2010), the policy fields in which SI initiatives are active link with scattered policy competences, meaning the responsibility is scattered over different institutions and levels. This provokes a lack of coordination between the different institutions and levels. Moreover, this lack of coordination causes less critical

interventions, and overlaps and inconsistencies in policies. Therefore, the main institutional barrier for SI initiatives lies in the lack of coordination between institutions considering policies (BEPA, 2010). Better coordination between the different institutions and levels could lead to a more common strategy that ensures policies remain consistent. Apart from a lack of coordination in the policy field, there is also a lack of coordination between SI initiatives themselves and between SI initiatives and potential funding companies (Mulgan et al., 2007; BEPA, 2011; Chalmers, 2012). This lack of coordination is mainly caused by SI initiatives that remain focused on their area of expertise and do not look across these boundaries. Consequently, this results in SI initiatives not working together, not learning from each other, and not sharing knowledge, which is for the benefit of the, often similar, social goals they all have. According to BEPA (2010) and Chalmers (2012) this originates from a lack of mutual awareness, trust, and communication.

This discussion illustrates the importance of proper coordination between policy institutions for the benefit of SI initiatives and proper coordination between SI initiatives themselves. BEPA (2010: 106) illustrates this importance with this metaphor: "scaling up SI initiatives requires 'bees', small organisations, individuals and groups that have new ideas, and are mobile, quick and able to 'cross-pollinate' to find big receptive 'flowers', that is big organisations, such as governments, companies or non-governmental organisations, which are generally poor at creativity but good at implementation and which have the resilience, roots and scale to make things happen." These 'bees' have to improve communication with each other in order to create trust, which makes it possible to learn from each other, share knowledge, and identify common goals. On the other hand, it is necessary for the 'flowers' to improve the

coordination between policy institutions for more consistent and coherent policies.

Legal and cultural barriers

The main legal and cultural barrier is the lack of legally and culturally recognized SI initiatives (BEPA, 2010). Currently, SI initiatives are not recognized by law, which makes a distinction between a social enterprise and regular business impossible. For many SI initiatives, it is nearly impossible to adhere to all regulations due to limited financial and personal resources. Furthermore, a lack of legal recognition limits a clear distinction between organizations addressing social goals and which are not (BEPA, 2010). Because there is no clear distinction, it is not easy to collect data on the size and impact of SI initiatives. Also, in society, SI initiatives often remain unrecognized for their work. Currently, the most dominant way of thinking is that public institutions are responsible for addressing social needs instead of SI initiatives. This lack of knowledge is currently hampering the support of SI initiatives (Phillips et al., 2015).

According to Davies (2019), governments continue to struggle with how to manage food waste prevention initiatives. The main problem currently lies in the so-called one-size-fits-all approach currently in place in many countries and urban areas. This approach does not look at the scale or purpose of food waste prevention initiatives resulting in small initiatives run by volunteers that need to adhere to the same rules as a multinational food retailer. Not making a distinction between these two types of organizations creates legal and financial barriers for initiatives such as seed swapping, community kitchens and also the act of selling home-cooked food, because small organizations do not have the resources to adhere to all the

regulations and fill out the necessary paperwork (Mourad, 2016; Davies, 2019). Davies (2019: 47) explains that most of these activities of food sharing initiatives are "considered illegal under existing regulations; but these initiatives have little ability to change their activities to fit the legislation, and limited power and influence to demand regulatory review.". For example, the EU considers all activities focussed on redistributing food as similar activities, meaning that all activities, ranging from small to big, have to adhere to the same regulations. This regulation aims to minimize food risk and maximizing food safety. It does not distinguish a small organization consisting of a few volunteers from a multinational retailer. Both have to show their food sources (the suppliers) and where their food ends up (who is the recipient). Furthermore, they have to handle their food correctly, for instance, proper storing and transportation. These regulations all serve to make sure that redistributed food follows the same procedure as the food in the mainstream market, and is of sufficient quality. A clear example in the Dutch context is the rise of living-room restaurants, where hobby chefs prepare food for groups of people in exchange for financial compensation (Bouma, 2015). Here the Netherlands Food and Consumer Product Safety Authority (NVWA) states that once you start preparing, cooking, and selling food, you will have to adhere to the same rules as restaurants such as hygiene, fire-safety, and tax forms. In practice, it is impossible to transform a simple home-kitchen into a kitchen that follows all the rules concerning hygiene, making the living-room restaurants technically illegal. However, the NVWA does not have the human resources to enforce the regulations by inspecting the hundreds of living-room restaurants. This example shows that it is difficult to adhere to all regulations. However, it also shows that it remains possible for food waste prevention initiatives to keep working because the regulators often tolerate initiatives. Nonetheless,

these initiatives will always remain at risk since they are illegal by law.

Lack of knowledge and skills

Related to the lack of recognition and coordination, a lack of knowledge and skills also forms a significant barrier (BEPA, 2010). This barrier cuts both ways, whereas the work of a social innovator is not recognized as a profession due to limited training for developing skills, while on the other hand, the limited amount of training is not helping to professionalize the work of a social innovator. Thus, knowledge and skill strongly correlate, meaning that a lack of knowledge corresponds with a lack of skills and vice versa. The development of these skills through training is crucial for a social innovator to be successful. Especially since SI initiatives often move across different fields and domains, a social innovator needs new skills to move across these boundaries and initiate new connections. The coordination among different institutions has illustrated the importance of these skills. Moreover, according to BEPA (2011), several studies have underlined the importance of training, and a lack of training is thus one of the main barriers in the social innovation initiative sector. Especially small organizations are subject to this problem, resulting in a staff experiencing so-called skill gaps. As is mentioned various times, employees in the social innovation initiative sector need to be multi-skilled, especially in small organizations. These organizations often experience a lack of skills in marketing, fundraising, knowledge of the legal system, and the use of IT for strategic purposes. Additionally, medium-sized organizations often experience a lack of leadership in their organization. Furthermore, having an under-skilled staff negatively impacts organizations through an increasing workload and need for more volunteers. Where organizations usually have

a policy in place that allows for training to address these skill and knowledge gaps, SI initiatives often experience a lack of time and money to address these gaps. In sum, this results in SI initiatives struggling to realize their ambitions.

Lack of monitoring

Related to legal recognition, a lack of data on the impact of SI initiatives forms a barrier that hampers the development of SI initiatives (BEPA, 2010). As is illustrated throughout this chapter, social innovation is challenging to define, especially in a legal context. Because SI initiatives are not legally recognized, there is limited data available on the sector itself. Most countries only collect data from organizations with an acknowledged legal form. Furthermore, when countries would be able to collect reliable data on SI initiatives, it remains challenging to analyze this data. Inherent to SI initiatives is that the impacts are difficult to quantify. A frequently used indicator is the number of initiatives or participants, but this is a weak indicator to determine the real impact of SI initiatives.

Infrastructure

Another barrier specifically for food waste prevention initiatives concerns the necessary infrastructure and technology for setting up food sharing initiatives. Mourad (2016) argues that entrepreneurship, better logistics, and innovative technologies are crucial in tackling food waste. One could argue that the inability to set up a new logistical system that connects a surplus of food to organizations that make good use of this food surplus is an essential barrier. Furthermore, the same could be argued for technological innovation e.g. the inability to set up a mobile

application or website. Both are related to the financial capacity of the organization in question.

2.4 Conclusions and research gaps

Chapter 2 shows that there is a lot of information and knowledge at hand regarding the concept of social innovation and food sharing. However, governing these innovations, especially in the context of food waste, remains underexposed (BEPA, 2011; Chalmers, 2012; European Commission, 2016; Wolfram, 2016; Davies, 2019). This gap corresponds with the recommendations in the FUSIONS project (Food Use for Social Innovation by Optimising waste preventioN Strategies) (European Commission, 2016). Firstly, the FUSIONS project stresses the importance of developing guidelines for policy interventions. Secondly, it recommends to develop guidelines for financial support for SI initiatives. Thirdly, it urges to facilitate knowledge transfers between different SI initiatives in the EU.

Furthermore, Davies (2019) shows significant barriers for governments in governing food waste prevention initiatives and advocated for more experiments with new types of regulation. How these experiments would look like in practice remains unknown and is something that needs more attention in further research. Moreover, it also remains unknown how these innovations could overcome these barriers. Further research would be valuable for SI initiatives to grow (Chalmers, 2012). The role of governments and municipalities also receives little to no attention in the current academic literature. Nevertheless, studies emphasize the vital role they play in the governance of SI initiatives (Wolfram, 2016; Davies, 2019). An important condition for good governance of SI initiatives is legal recognition to distinguish SI initiatives from other businesses (BEPA, 2010;

Davies, 2019). However, the current one-size-fits-all approach makes this impossible, which also hampers monitoring the impact of SI initiatives.

Davies (2019) shows that the impact of food sharing remains unknown. Currently, there is little to no information on the impact that food waste prevention initiatives have on their cities' food systems. However, this is not only the case for food waste prevention initiatives but also counts for SI initiatives in general (BEPA, 2011). More research is necessary to make it possible to monitor the real impact of food waste prevention initiatives (Davies, 2019). It is possible to argue that this research gap is more a practical gap since ways to measure social impact do exist, such as Social Return on Investment and Social Impact Assessment (BEPA, 2010). For food waste prevention initiatives, tools like Life Cycle Assessment (LCA) and Material Flow Analysis (MFA) are useful to monitor the amount of food waste. However, in order to do so, food waste prevention initiatives need to monitor their activities in great detail. They need to categorize and weigh all the food they collect in order to assess their impact. This thesis will not use these tools since it will take too much time to collect all this data from food waste prevention initiatives. Chapter 3 will discuss which methods this thesis uses instead.

3

Chapter 3: Conceptual framework and methodology

A conceptual framework is required to systematically measure the impact of food waste prevention initiatives towards preventing food waste. For this research three frameworks were selected as potentially useful. These frameworks are the conceptual framework for backcasting experiments of Quist, Thissen, and Vergragt (2011) (see appendix A), the conceptual framework for sustainability transition experiments of Luederitz et al. (2016) (see appendix B) and lastly, the Transformative Social Innovation Framework by Haxeltine et al. (2017). Although the framework for backcasting experiments of Quist, Thissen and Vergragt (2011) provide relevant elements such as the dynamics of internal and internal factors on the impact of a backcasting experiment, it is not focused on disrupting dominant institutions. Furthermore, the framework for sustainability transition experiments of Luederitz et al. (2016) provides a useful evaluation scheme that is generally applicable. Nonetheless, it does not build on a relevant social theory. Therefore the Transformative Social Innovation Framework by

Haxeltine et al. (2017) was deemed as the most relevant conceptual framework for this research.

This chapter will explain what this conceptual framework entails and how it will be applied in this research. Furthermore this chapter discusses which research methods this thesis will use in order to study the impact of food waste prevention initiatives.

3.1 Transformative social innovation framework

As discussed in chapter 2, the concept of Transformative Social Innovation (TSI) is disruptive and aims to achieve societal transformation. Avelino et al. (2019: 198) conceptualize this transformative change as "an emergent outcome of co-evolutionary interactions between changing paradigms and mental models, political institutions, physical structures, and innovative developments on the ground." More specifically, this change results from the interaction between game-changers, narratives of change, system innovation, and social innovation, which are perceived as the four shades of change and innovation. These four shades built on the Multi-Level Perspective (MLP) framework for societal transitions, which consists of three levels: (1) the landscape, (2) regimes (dominant institutions and practices), and (3) niches (places of innovative practices). The MLP theorizes that when changes on all three levels support each other, it catalyzes an 'overall systemic transformation', or in simpler terms, a transition. Using the MLP as a base, the four shades of innovation and change are operating at different levels (Avelino et al., 2014). SI initiatives (SI) are conceptualized as "new services, practices or ideas at the micro level" (Avelino et al., 2014: 7). System innovation is

conceptualized as changes in regimes at the meso level, such as institutions, social structures, and physical structures. Game-changers are operating at the macro level. They are events, trends, and developments such as climate change or the economic crisis, which can alter the rules, fields, and players of the 'game'. Lastly, Wittmayer et al. (2015: 2) define narratives of change as "sets of ideas, concepts, metaphors, discourses or story-lines about change and innovation" (Wittmayer et al., 2015: 2). Therefore, Avelino et al. (2014: 7) envision TSI as a "nonlinear interaction between these levels of change and innovation, and introduced 'narratives of change' as a particular communication between these different levels". These four shades need to interact in order to push for transformative change.

Social innovation and the agents of social innovation (section 3.1)

- **Social innovation (SI)** –changes in social relations, involving new ways of doing, organising, framing and/or knowing.
- **Social innovation agents (SI-agents)** – agents that are engaged in social innovation, with particular focus on SI-actors, SI-initiatives, SI-networks and/or SI-fields.

Transformative social innovation, coevolution and the social-material context (section 3.2)

- **A social-material context** – set of relevant contextual factors that includes institutions, resources and practices; and processes of structuration that result in varying degrees of institutionalisation.
- **Transformative change (TC)** – change that challenges, alters and/or replaces established (and/or dominant) institutions in (parts of) the social-material context.
- **Transformative social innovation (TSI)** –process, through which social innovations challenge, alter and/or replace established (and/or dominant) institutions in the social-material context, can be described as *TSI-journey*.
- **Coevolution** – a metaprocess occurring between some form/s of situated novelty (e.g. SI) and (parts of) the social-material context.
- **Institutional Logics (ILs)** – logics, which both regularize behaviour and at the same time enable agency and change; may be contested, multiple, and/or overlapping
- **Strategic Action Field (SAF)** – the 'web' of social-material relations and institutional arrangements through which the emergence and unfolding of a *TSI-journey* takes place.

TSI-agency and (Dis)Empowerment (sections 3.3 and 3.4)

- **TSI-agency** – capacity of SI-agents to contribute to transformative change.
- **Transformative impact, potential and ambition** –different levels in the extent to which SI-agents contribute to transformative change.
- **(Dis) Empowerment** – process in which SI-actors gain a sense of autonomy, relatedness, competence, impact and meaning.
- **Narratives of change** – sets of ideas, concepts, metaphors, discourses or story-lines about (transformative) change and innovation.
- **TSI-strategies** – the strategic actions of SI-agents towards transformative change.

Figure 3.1: Main components of TSI Framework. Source: Haxeltine et al. (2016)

Figure 3.1 gives an overview of all the main components of the TSI framework. The components are divided over three groups: (1) SI and SI-agents, (2) TSI, coevolution and socio-material context, and (3) TSI-agency and (Dis)empowerment) (Haxeltine et al., 2016). The TSI framework is primarily focused on SI-agents and SI initiatives.

First of all, SI is defined as new activities that generate a change in social relations. These new activities should incorporate "new ways of doing, organizing, framing and/or knowing." (Haxeltine et al., 2016). SI initiatives are defined as a collective of individuals that are working on socially innovative ideas and/or activities. A network of SI-initiatives can be conceptualized as SI-networks, while SI-agents is a more general conceptualization that includes any group, network, or field that engages in SI processes. Looking more closely, 'doing' are the actions of SI initiatives, for instance, developing and using an online application to collect food (Haxeltine et al., 2016). 'Organizing' is about how the initiative is organized and governed. 'Framing' is about how problems are defined and about a drawing a future vision. Lastly, 'knowing' is about the knowledge at hand and the use of cognitive resources and specific competencies, such as raising funds, communication skills, and the ability to learn from their activities.

The TSI framework is outlined in figure 3.2, which illustrates the dynamics of the TSI process, and thus the process that the SI initiatives go through when enhancing societal transformation (Haxeltine et al., 2017). It also depicts the reciprocal relationship between the TSI processes from figure 3.1 and the social-material context, which means that SI, SI-agents, and the social relations around them continuously undergo change (Haxeltine et al., 2016). However, TSI processes also contribute to a changing

social-material context through agency, which can be distinguished in three different ways: challenge, alter, or replace. Challenging concerns questioning the existing institution's legitimacy. Altering is about changing elements of existing institutions or adding new complementary elements. Lastly, replacing is about (partly) substituting existing institutions for new institutions (Haxeltine et al., 2016).

In this journey, SI initiatives aim for achieving transformative change. According to Avelino et al. (2019), transformative change is systemic and can achieve "irreversible, persistent adjustment in societal values, outlooks and behaviors." (Avelino et al., 2019: 196). As said, it results from the interaction between the four shades of change and innovation. This means that when studying transformative change, it is vital to make sure all three levels (micro, meso and macro) are considered. Another critical aspect of transformative change is their narratives of change, which examine to what extent SI initiatives want to challenge, alter or replace existing institutions of current production and consumption habits (Strasser, de Kraker & Kemp, 2019). SI initiatives develop a future vision, while the narratives of change outline the steps towards achieving this future. However, the steps for achieving this transformative change are an iterative process that is under constant experimentation and reflection. Additionally, they are shaped through interaction between other actors and SI initiatives. When examining TSI processes, it is also crucial to consider the institutional dynamics to understand these processes better. Institutions can be both formal and informal and can be defined as: "norms, rules, conventions and values that both constrain and enable social relations and established patterns of doing, organizing, framing and knowing" (Strasser, de Kraker & Kemp, 2019: 3). These institutions exist in the socio-material context that shapes the

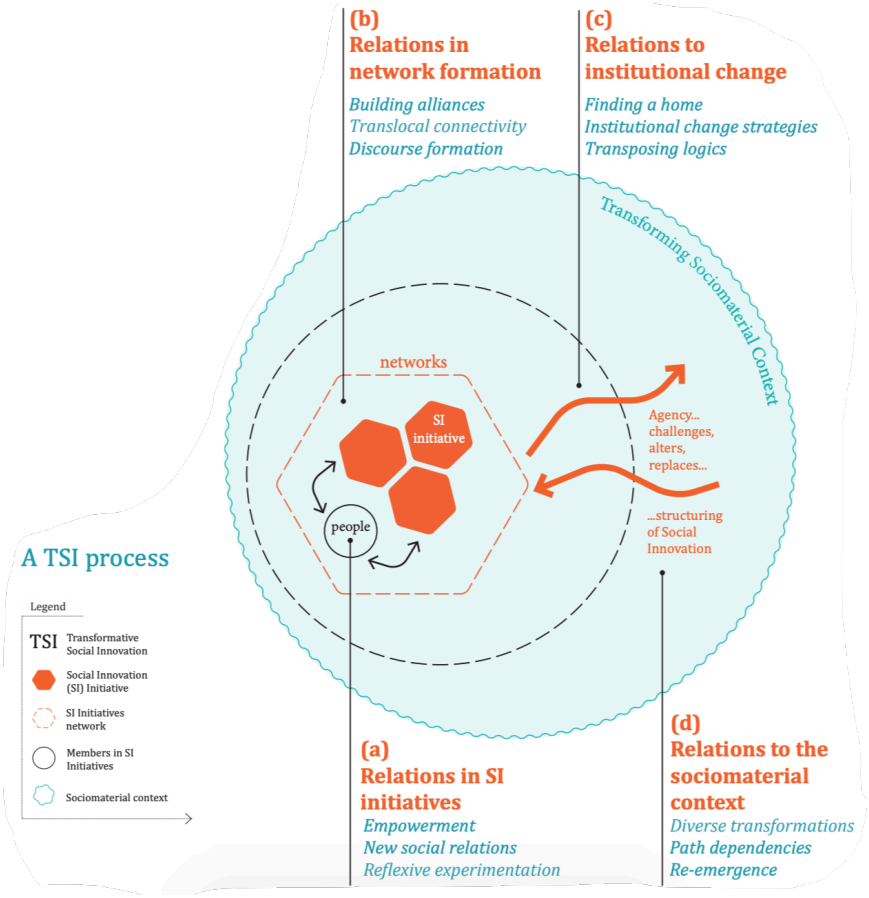

Figure 3.2: TSI framework. Source: Haxeltine et al. (2017)

current production and consumption habits of products and services (Kanidou, 2019).

The process in figure 3.2 starts with: (a) relations in SI initiatives wherein individuals connect to form SI collectives. Since SI initiatives typically not tend to work alone, the first process is closely related to process (b) network formation; wherein SI initiatives try to create networks or niches. The formation of networks can be linked to process (c) institutional change,

wherein SI initiatives aim to tackle identified social problems by generating new knowledge and develop new practices. Ultimately, all processes are highly dependent on process (d) the socio-material context, which shapes how SI initiatives develop (Haxeltine et al., 2017). In sum, figure 3.2 shows that SI initiatives are not transformative on itself, but emerge from the interaction between networks, institutions, and the socio-material context.

Conclusion TSI

All three frameworks show that, when measuring the impact of transitions related to sustainability, it is essential to consider that such a transition is dependent on various interrelated dimensions. This thesis research is directed towards the impact and governance of food waste prevention initiatives, and the barriers and drivers that influence their impact. The TSI framework was deemed to be the most suitable for the purposes of this research because it provides a relevant social theory. Just like SI initiatives conceptualized by Haxeltine et al. (2017), food waste prevention initiatives are currently altering (or striving to alter) social relations and institutions by new ways of organizing, doing, framing, and knowing. These initiatives create new relations between producers, retailers, and consumers, and also create new social relations around the food they share. Consequently, food waste prevention initiatives strive for transformative change by offering a space wherein individuals are empowered through the possibilities to experiment with new or alternative values and ways of doing. This allows food waste prevention initiatives to challenge, alter or replace dominant institutions. Another similarity is that food waste prevention initiatives take action as an individual, group and sometimes even networks. This corresponds with the TSI theory, wherein SI

initiatives emerge from individuals and eventually grow into networks or niches.

3.2 Framework and indicators

Conceptual framework

Due to limited resources and time constraints it is impossible to analyze all the effects of food waste prevention initiatives. The main impact area's of these initiatives are deemed to be of environmental and socio-economic nature. Therefore, this research is solely focussed on these themes. Furthermore, this research aims to provide insights in the barriers and drivers experienced by these initiatives.

In order to research the impact of food waste prevention initiatives in Amsterdam, every single initiative will be analyzed individually. Following the TSI theory, this means that every initiative's way of organizing, doing, framing and, knowing is studied. The analytical framework illustrated in figure 3.3 follows the logic of the TSI theory, wherein interaction between the four shades of innovation leads to transformative change. More specifically, this research focusses on the processes within the food waste prevention initiatives initiatives. The framework in figure 3.5 is derived from Kanidou (2019) and depicts the main elements of food waste prevention initiatives following the TSI theory. It includes ways of organizing what represents how the food waste prevention initiative is organized, ways of framing which represent the vision of the initiative, ways of doing what represent the activities of the initiative, ways of knowing which represents learning and experimentation of the initiative and the impact which relates to the transformative change these

initiatives want to achieve. Lastly, The Narrative of Change interacts with al these elements and guides the initiatives' ways of organizing, framing, doing and knowing.

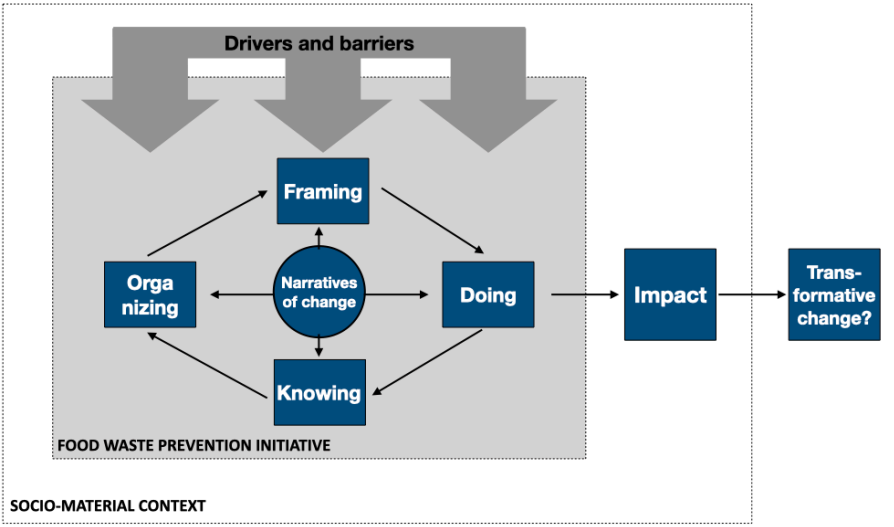

Figure 3.3: Analytical framework for measuring impact of SI initiatives against food waste. Source: Author

Examining these elements will help to answer the main research question. However, these elements do not exist in itself but are all interrelated. The actors that run or volunteer within the initiative have specific values, which shape their narratives of change. These narratives will help create a vision and outline actions deemed necessary to achieve this vision. In addition, these actions are subject to experimentation and learning, meaning the way these initiatives work is always under revision. Eventually, the actions will have a particular impact, either environmental, social and/or economic.

When researching these initiatives, it is vital to bear in mind that they are not unaffected by their surroundings. The social-material context influences how the actors think and envision the future. Furthermore, it determines the steps they take to

achieve this vision. Consequently, it also affects the impact these initiatives achieve. This social-material context consists of drivers and barriers influencing food waste prevention initiatives. For example, the lack of measurements hinders the ability for food waste prevention initiatives to learn from their activities. A lack of knowledge and skills holds food waste prevention initiatives back when it comes to carrying out their activities successfully. Economic, political, legal, and cultural barriers could pose as barriers that influence the 'organizing', 'doing' and 'knowing' of initiatives. For instance, legal barriers limit the scope of activities for initiatives due to strict rules regarding the handling of food. Alternatively, political barriers affect the 'knowing' of initiatives due to a lack of coordination between different initiatives. Economic barriers, such as lack of subsidies, could also hinder the 'organizing' of the initiative by limiting initiatives to grow in terms of employees. Examples of drivers are structural support for initiatives, either in money or services, and the intrinsic motivation of volunteers that are working at the initiative.

Lastly, to analyze the transformative ambition, potential, and impact of food waste prevention initiatives, this research uses the three levels of transformative change identified by Haxeltine et al. (2016). The transformative ambition relates to the vision or ambition the initiatives have to achieve transformative change through e.g. a mission statement. The transformative potential is the object, idea, activity, or agent that can challenge, alter and/or replace dominant institutions in a particular social-material context. The transformative impact is the actual evidence a food waste prevention initiative shows of having achieved transformative change. A crucial element in achieving transformative change is realizing system innovation. By analyzing these three levels, it is possible to examine to what

extend food waste prevention initiatives have achieved transformative change.

Impact indicators

Based on Haxeltine et al. (2016) this thesis uses the following indicators to analyze the ways of organizing, doing, framing, and knowing of food waste prevention initiatives. First of all, with regards to the ways of organizing, this thesis will research the origin of the initiative, its organizational structure, and its core values. Secondly, concerning the ways of doing, this thesis will research the initiative's business model, main activities, main products, partners, and sales/users. Thirdly, regarding the ways of framing, the future vision of the initiative, its view on other food waste prevention initiatives, and its views on food waste nationwide are studied. Lastly, the ways of knowing are researched by studying how the initiative monitors and evaluates its activities, generates knowledge, shares knowledge, and uses networks.

Furthermore, table 3.1 gives an overview of the indicators used to measure the environmental en socio-economic impact of the food waste prevention initiatives in Amsterdam. The socio-economic impact consists of the social en economic impact. However, since the economic impact also corresponds to having a social impact, making food more affordable, they are integrated into a socio-economic impact.

Table 3.1: overview impact indicators. Source: author

Impact	Indicators
Environmental impact	Amount of food collected (in kg)
	Amount of CO_2-eq emissions avoided (in kg)
Social impact	Social interaction
	Awareness
Economic impact	Number of employees
	Type of economic activities

First of all, the environmental impact of food waste prevention initiatives is assessed using the amount of collected food and its corresponding CO_2-eq. emissions. Research shows that CO_2 emissions are the main driver behind climate change (McMichael, 2003). Climate change causes more vector-borne diseases, food-borne infections, exposure to extreme temperatures, disturbance of food systems, sea-level increase, and as a consequence, displacement of entire populations. To roughly determine the environmental impact of food waste prevention initiatives in terms of CO_2-eq., the Food Wastage Footprint report of the FAO (2013) is used. The FAO concludes that a total of 1.3 gigatonnes of edible food is wasted annually. This waste equals 3.3 gigatonnes of CO_2-eq. Based on these numbers, it is possible to conclude that 1 kg of food equals 2.54 kg of CO_2-eq. This amount will be used throughout the research for converting the amount of saved food into CO_2-eq. emissions. Logically the more food an initiative collects, the more food and CO_2-eq. emissions it saves. The most useful unit is kilograms. To interpret this environmental impact in a broader context, this thesis uses the work of Coudard (2019), who performed an MFA analysis on Amsterdam's food waste streams. This analysis helps to understand their impact on Amsterdam's food system by

comparing the amount of food waste prevented with the total amount of food waste in Amsterdam.

Second, the social impact is assessed using two indicators: social interaction and awareness. Social interaction will be measured through the amount of physical interaction and assumed the quality of this interaction. According to Bernstein et al. (2018), social impact can only occur when an interaction is possible. However, it is essential to note that there are different levels of social interaction. They are ranging from just making eye-contact, to having a conversation with the cashier and having dinner together. An essential difference between these levels of interaction is that some interactions do not have a 'preexisting closeness' between the people that interact with each other (Bernstein et al., 2018). For instance, many customers have no relation with the cashier at the store they buy food. Nonetheless, Wesselmann et al. (2012) show that even the slightest form of social interaction, such as making eye contact, has a positive effect on someone's well-being. Having eye-contact makes people feel socially included while having no eye-contact makes people feel invisible and excluded. Bernstein et al. (2018) acknowledge this by stating that negative social interactions could lead to more stress and cardiovascular diseases. On the contrary, positive social interactions have a positive effect on people's health and well-being. Also, the amount of social interactions makes a difference, being associated with more people tends to make people happier. In short, the more possibilities for social interaction, the higher the social impact. Possible ways of creating social interaction through food are community dinners or food markets. Davies (2019) argues that the sharing of food is in itself already a social practice. Therefore, it is essential to measure the social interaction these SI initiatives help to stimulate or not.

The level of awareness is measured by looking at the activities they engage in to educate and activate people to take measures against food waste. Schanes, Dobernig, and Güzel (2018) show that awareness about food waste is vital to help to prevent food waste. Lack of knowledge about storing, cooking, and assessing the edibility food negatively impacts the amount of food waste. Moreover, there is a lack of knowledge about the social and environmental effects of food waste and waste in general. Improving this knowledge should lead to lower amounts of food waste. According to the Dutch Nutrition Centre (Van Dooren & Mensink, 2018), Dutch consumers would like to access more information about storing food, correct portion sizes, and understanding expiration dates. Furthermore, Vermeir and Verbeke (2006) show that being more informed and aware helps to close the 'attitude - behavioral intention' gap, which is the gap between the intention of doing something and truly doing it. For instance, the intention to reduce the amount of food production or consume less food. Research shows that 90% of Dutch consumers intend to reduce their food waste (Van Dooren & Mensink, 2018). Moreover, although 93% of Dutch households are aware that there is much food waste, they do not blame themselves and blame other households. This attitude suggests that they underestimate their contribution to the amount of food waste. It is thus important to look at how these food waste prevention initiatives increase people's knowledge and look at how they activate people to take measures to prevent food waste. Therefore, this thesis will focus on the extent to which activities focus on increasing people's capacity to reduce the amount of food waste they produce.

Third, according to The Young Foundation (2010:22), social innovation is in contrast to economic innovation "not about

introducing new types of production or exploiting new markets in itself but is about satisfying new needs not provided by the market (even if markets intervene later) or creating new, more satisfactory ways of insertion in terms of giving people a place and a role in production." Avelino et al. (2014) agree and add that SI initiatives are about disrupting existing institutions, including economic systems. In doing so, it advocates for a collaborative and solidary economy, wherein the focus lies on sharing, and inclusion such as more local involvement when making a decision. Features of such an economy are local sharing of goods, a basic income, and collective governance of assets. Research shows that especially the third sector in Europe is of great importance in terms of employment (The Young Foundation, 2010). This sector also proves to be a significant contributor when it comes to national expenditures. Unfortunately, information on the share of SI initiatives in terms of employment and expenditure remains limited, but one could argue that they have an economic impact in terms of employment and expenditure. Additionally, many SI initiatives are actively trying to re-integrate excluded groups into the labor market (The Young Foundation, 2010). This integration makes it possible to create new jobs at places previously disconnected to the labor market (Thompson, 2018). One could argue that this has positive effects on these excluded groups and neighborhoods, mainly because these activities give them something meaningful to do. Therefore, this thesis will use the following indicators to evaluate the economic impact of food waste prevention initiatives: (1) employment, in terms of how many people they employ, and (2) the economic activities the initiatives organized. For instance, how do these initiatives share their food? Furthermore, more importantly, do these initiatives engage in an economy that shows solidarity and collaboration?

3.3 Research design

Case study design

The research strategy for answering the main research question is a case study design. Yin (2009: 18) defines a case study as "an empirical study that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". This phenomenon, however, is spatially bounded (e.g. a person, political party, municipality, country), which is observed with temporal boundaries (e.g. a single point in time or fixed period) (Gerring, 2004). An integral part of a case study is the unit of analysis, which is described as the entity being studied (e.g. a person or a group of persons) (Bryman, 2012; Yin, 2009). As introduced in chapter 1, this research focusses on answering the following research question: *What is the impact of food waste prevention initiatives in Amsterdam?* In correspondence with the identified knowledge gaps and following the case study typology introduced by Yin (2009), this case can also be characterized as an explorative case study on the impact of food waste prevention initiatives in Amsterdam. Since there is currently no data available on their impact, this thesis is the first to study this impact.

Research design: multiple case study

Since this research aims to analyze the impact of multiple food waste prevention initiatives, this thesis uses multiple case study design (Yin, 2009). This research design allows for studying different food waste prevention initiatives in Amsterdam. Moreover, it allows for analyzing and comparing each initiative.

This makes it possible to generate more compelling and reliable results compared to a single case study design. A crucial element in achieving such results is the case selection. In this process, it should be made clear that the selected cases "serve a specific purpose in the overall scope of the inquiry" (Yin, 1994: 45). The central unit of analysis in this multiple case study is food waste prevention initiatives.

Data collection

For all questions, the primary data source is semi structured in-depth interviews with an open format (see appendix C for a list of interviewees). The interviews allow for the collection of qualitative and quantitative data. According to Bryman (2012) in-depth interviews are often a combination of unstructured and semi-structured interviews. This means that some key questions need to be asked, but this does not entail the entire interview. Additionally, the interviews are held in an open format, allowing interviewees to express their answers in their own way (Walliman, 2006). See appendix D for the semi-structured interview format for interviews with the initiatives. The interviews are recorded and transcribed afterward. The transcription of interviews will not be a literal transcription since the purposes of this research are not to analyze interviewees' linguistics (Kvale, 2011). Therefore, the edited transcription method is used. This method means that the audio recordings are not transcribed word-by-word, but are transcribed focussing on the content of what is said, and leaving out unnecessary details such as laughs and hiccups. However, it is important to pay attention to detail in order to catch possible nuances after bold statements.

Research ethics

When conducting interviews, a researcher needs to handle the collected data responsibly. Before the interview takes place, the researcher sends the interview questions in advance to the interviewee. At the start of the interview, the interviewee is asked for permission for audio recording and use of his or her name. Afterward, the interviewee is allowed to review the preliminary results and selected quotes. If the interviewee does not agree with the use of a particular quote or feels misinterpreted, it is possible to express these concerns. These concerns are taken into account when writing in the final report.

Data analysis

The deductive approach to qualitative research

This thesis uses a deductive approach to provide new insights into the impact and governance of food waste prevention. In this approach, the goal is not to derive new theories from research (Bryman, 2012). Instead, this approach is testing existing theories. Therefore, this thesis will test the insights from the reviewed literature in chapter 2 with the data retrieved from the various case studies.

A deductive approach uses the deductive coding method as the analytic process that conceptualizes the data (Bryman, 2012). Deductive coding uses a code list that is determined before the start of the data analysis. The code list rests on theoretical concepts reviewed in chapters 2 and 3. It uses the theory provided by Haxeltine et al. (2016) considering the ways of organizing, doing, framing, and knowing introduced in chapter 3. Furthermore, it uses the drivers and barriers introduced by

several authors in chapter 2. See appendix E for the full code list. This thesis will use coding software Dedoose to analyze the data systemically.

Cross-case comparison

A cross-case comparison increases the reliability of the results since it allows the researcher to put the results on a broader perspective (Meyer, 2001). By comparing the various cases, this process aims to identify the main similarities and differences among food waste prevention initiatives. The indicators used to compare these cases should be based on existing literature or the research problem (Eisenhardt, 1989). Therefore, this thesis uses similar indicators as for the individual case analysis.

3.4 Case selection

The selection of case studies is based on the research goals and scope introduced in chapter 1 and the typology for food sharing activities provided in chapter 2. Table 3.2 illustrates the selection criteria used for choosing case studies that can provide useful input and serve the goals of this research.

Internet research is used to identify potential cases that concern data gathering through journal databases, online books and newspapers, social media sites, and other websites (Lambertz-Berndt & Allen, 2018). Additionally, the SHARECITY database of Davies et al. (2016) was used to identify 29 different initiatives that are actively sharing food in Amsterdam. However, after delving deeper into the initiatives' activities, only a handful met the selection criterion. The snowballing method identified more initiatives that met the selection criteria. A total of 19 initiatives were approached, of which six initiatives were willing to do an

interview (see table 3.3). Of these 19 initiatives, three initiatives were no longer active in Amsterdam, and three initiatives claimed their focus is not on preventing food waste. The remaining seven initiatives were not open to doing an interview and did not respond to various emails and phone calls.

Table 3.2: Selection criterion for case studies. Source: author

Criterion	Description
Location	The selected cases should be active in Amsterdam, either with a physical location or with their provided services
What is shared	Following the typology introduced in chapter 2 the cases need to share 'stuff', so processed and/or unprocessed food
How is it shared	Following the typology introduced in chapter two the cases need to share the food through collection after which it is either gifted, bartered or sold.

It is important to mention that there is an abundance of food waste prevention initiatives in Amsterdam. However, not all initiatives are concerned with the collection of leftover food from supermarkets, grocers, and the catering industry. Notable is that some innovations have ceased to exist over the years, such as Breadcycle and Dumpsterdam (Meischke, 2018). Also, there are many organizations involved with educating people on food waste such as Amsterdam Green Campus, Amsterdam&co, ANMEC, Food Academy, or Amsterdam Metropolitan Solutions (Voedsel Verbindt, 2020). Lastly, some organizations only focus on urban farming, such as Fruittuin van West, Stadsboerderij

Osdorp, I can change the world with my two hands (Voedsel Verbindt, 2020) and lastly Ubuntu stadstuin Zuidoost (Davies et al., 2016).

Table 3.3: Selected food waste prevention initiatives. Source: author

Cases	Description
Taste Before You Waste	Founded in 2012 Taste Before You Waste (2019) collects unsold food products at a select number of grocers. These food products are gifted to charitable organizations, gifted by setting up a mini-supermarket or gifted by hosting 'wasteless diners'.
Guerilla Kitchen	Since the end of 2014 Guerrilla Kitchen (2019) provides free meals prepared using unsold food products collected from or gifted by supermarkets (Meischke, 2018).
De Kaskantine	De Kaskantine (n.d.) is an urban farm cafe that is completely self-sufficient when it comes to energy and water. Along with growing vegetables and fruit themselves they collect unsold products at supermarkets to provide free meals. In addition to free meals, music is provided in the weekend.
De Tweede Jeugd	De tweede jeugd (n.d.) collects leftover bread from bakeries and uses this bread to make crostini's, 'bread and butter' and grilled sandwiches. These products are sold at more than 30 locations in and around Amsterdam.
Healthy & Affordable	Healthy & Affordable (2020) collects leftover food from supermarkets and food distributors. By dehydrating, freezing and pickling this leftover food, Healthy & Affordable tries to prevent food waste. It sells packages filled with dried fruits, chocolates and nuts, and flavored powders.
Too Good To Go	Too Good To Go (2020A) is a mobile application which is founded in 2015 in Denmark. The application is active in 15 countries among the Netherlands. In every country the application relies on local networks consisting of supermarkets, farmers, restaurants and bakeries. The food companies active in the network provide a box of unsold food products which are discarded and the application lets the users know where such boxes are available for pick-up with a discount.

4

Chapter 4: Case study results

This chapter discusses how each case engages with ways of organizing, doing, framing and knowing as outlined in chapter 3. Additionally, the environmental and socio-economic impact of each case is evaluated.

4.1 Case 1: De Tweede Jeugd

DE TWEEDE JEUGD

GEEFT BROOD EEN TWEEDE LEVEN

In short: De Tweede Jeugd collects leftover bread with which it produces grilled sandwiches, crostini's, and bread & butter.

Organizing

Origin of the initiative

De Tweede Jeugd was founded in 2016 when Benjamin Namane (see appendix C) opened his first shop together with his partner Manuel Oostveen. He based their initiative on his past experiences working as a chef in the food sector. While he was working at Gebroeders Hartering, a renowned restaurant in Amsterdam, he learned to be creative with leftover food. It forced him to think of ways to use leftover meat and other products instead of wasting it. This experience sparked his interest in food waste and ultimately led to the idea to start an initiative. Not only did he start gathering information on how food shop owners deal with food waste, he also hosted a dinner event with leftover food. During this event, together with his future partner Manuel, he cooked a five-course dinner of products that would usually be discarded. The last course of the dinner was a Bread and Butter made from old bread from his local bakery. "This turned out to be very delicious.", Benjamin says. Because this dessert was such a success, they decided to start working with leftover bread. They also started experimenting with fruits and vegetables, but that turned out to be more complicated. In comparison to fruits and vegetables, bread has a much shorter lifecycle. "It is baked in the morning, and, while it's worth 3 euros at 5:45 PM, it immediately loses its value after 6:00 PM," said Benjamin. Experimentation thus led to the final version of the initiative. However, when Benjamin started De Tweede Jeugd it was not necessarily meant to be a social initiative. He simply wanted to do something with leftover food, such as bread, that would otherwise be discarded. Nevertheless, addressing a social problem like food waste plays

an important role at the Tweede Jeugd, albeit in an indirect manner.

Organizational structure

As of June 2019, De Tweede Jeugd is run solely by Benjamin because Manuel left. Before that, the decision-making process was very organic and tasks were often divided equally. Nowadays Benjamin decides manages the initiative by himself. Over the years, De Tweede Jeugd has had many different employees that were recruited through informal networks. All employees were paid so there was no volunteerism involved. A consequence of Manuel leaving was that all the activities of De Tweede Jeugd were outsourced to the production company Raaskal. Currently, Benjamin and two part-time employees manage De Tweede Jeugd.

Core values

The core value of De Tweede Jeugd is saving as much bread as possible. This is the main driver behind the initiative and will continue to be the reason for sustaining it. This is also what makes it enjoyable, according to Benjamin.

Doing

Activities

De Tweede Jeugd sells three different products: grilled sandwiches, bread and butter, and crostini. These activities are distributed unevenly throughout the year because of season dependency. The initiative's main activity, which is maintained all year, is the production of grilled sandwiches using old bread, or better called, unsold bread. Benjamin expects that the bread

and butter, one of the main reasons for working with old bread in the first place, will be taken out of production. This is mainly due to the lack of customers interested in the product. While De Tweede Jeugd only has two customers for the crostini's, they usually receive large orders during Christmas time. Before the production process was outsourced to Raaskal, Benjamin and Manuel as well as two part-timers made the grilled sandwiches themselves. and produced their own ingredients. Now De Tweede Jeugd only does the packaging for the grilled sandwiches.

Partners, clients and users

De Tweede Jeugd makes grilled sandwiches from leftover bread. Using boar ham, kimchi, and Surinam pom, they are not your everyday sandwiches. In the first years, De Tweede Jeugd only collected bread from bakery Bbrood. However, as they were starting to sell more grilled sandwiches, they needed more bread. Therefore they also decided to collect leftover bread from a production company that makes bread for supermarkets. This is fresh bread which is immediately frozen because of overproduction. Once a week, Raaskal collects the bread from a central pick up point where the bread is transported to Raaskal produces the grilled sandwiches after which De Tweede Jeugd packages them. Finally, another transport company distributes the sandwiches to their clients using the electric truck from De Tweede Jeugd. The same goes for the leftover bread from the other production company. Other partners are Wild van Wild, which makes ham out of boar meat, and OH NA MI, which produces kimchi. Benjamin intends to stay loyal to these partners. They originated from his old network and grew along with De Tweede Jeugd. Just like their employees, De Tweede Jeugd pays their partners for their products, including the

leftover bread. The bread only costs De Tweede Jeugd around €0,40 per loaf.

De Tweede Jeugd has a broad range of clients ranging from sports clubs to cafes and cinemas. They have around 26 clients, of which 23 are located in Amsterdam. De Tweede Jeugd sells their grilled sandwiches for between €2,- and €2,50. This allows their clients to have a profit margin of up till €4,-, with prices ranging between €4.- and €6,50. Alongside these clients, De Tweede Jeugd also sells grilled sandwiches in 8 supermarkets in Amsterdam, does catering for events or projects, and organizes the so-called 'Christmas package farmers.' The Christmas package farmers order thousands of Crostini's at the end of each year. De Tweede Jeugd does exert strict control on the ways in which its clients sell and distribute the sandwiches. "In the beginning we thought about this, but eventually our grilled sandwiches ended up in the places that we wanted to be. In the end it is about making impact which we do by selling grilled sandwiches. The more sandwiches we sell, the bigger the impact."

Framing

Vision for De Tweede Jeugd

Before Manuel left, they decided together on the next steps for the initiative. Now Benjamin manages De Tweede Jeugd by himself. For the short-term vision of the initiative, Benjamin is still figuring out what to do next. "I am currently at a crossroads and I have to figure out my next steps", Benjamin says. It is clear, however, that he needs a new partner. He will also take out the bread and butter from the catalog.

In contrast to the short-term vision, Benjamin has a bright future vision for the long-term. Instead of continuing to use leftover bread for their products, he wants to make fresh bread from leftover bread. Rather than using flour, this new bread uses a unique fermented mixture made from old bread. This not only allows for the bread to become fresh again, but the bread will also be made precisely in the way De Tweede Jeugd wants it. Consequently, this will lead to a more consistent product, because currently, De Tweede Jeugd uses three to seven different types of bread. This new type of bread will be kneaded in a square shape so that as much waste as possible will be prevented. Benjamin finds it difficult to find good bread for grilled sandwiches. "The bread has to be intact, even unsliced if possible, and it has to be properly stored and frozen."

A downside is that this will negatively affect the impact De Tweede Jeugd in terms of saving leftover bread. Using this formula, the initiative will be able to save less bread in quantitative terms. However, Benjamin thinks it is the only way to sustain De Tweede Jeugd as a company as he expects bakeries to have less waste as they optimize their production process. "In time, the relationship with Bbrood will not be sustainable anymore. I am too dependent on them for selling me their old bread." By changing to a different kind of bread, he hopes to continue selling grilled sandwiches. "Our customers not only buy our grilled sandwiches because to prevent food waste, they also buy them because they are delicious ".

Vision on food waste in general

Benjamin recognizes that there are currently a lot of bottom-up initiatives fighting food waste such as De Tweede Jeugd. As such, he thinks it is now time for bigger companies to do their part.

"They have to put words into action." Especially considering their impact, these companies are essential. Benjamin believes that De Tweede Jeugd will never make a significant impact. "From the start until now, we have saved about 35,000 loaves of bread. However, every day 400,000 loaves of bread are wasted. So we are just merely scratching the surface." According to Benjamin, De Tweede Jeugd inspires people by showing what is possible with old bread, but he also realizes that his initiative will never really achieve systemic change.

To give his argument more weight, he suggests that supermarkets and bakeries should have freezers to store leftover bread from the day before. This allows supermarkets and bakeries to sell their leftover bread straight from the freezer. Although he realizes that this might affect the amount of bread they will sell, he thinks it is something that just has to happen. “It is the most natural solution. Everyone at home puts their bread in the freezer." He also suggests that should order their bread beforehand, although this seems less likely to happen.

Looking at other initiatives focusing on food waste, Benjamin is most impressed by Too Good To Go. "It is something that is actually being used a lot, which is great", Benjamin says about Too Good To Go.

Knowing

Knowledge and networks

Benjamin gained his knowledge for starting De Tweede Jeugd from previous experiences in the food sector by working as a chef in restaurants. Over the years, he gained more and more knowledge about running a food business through his informal

networks. De Tweede Jeugd is also a member of the Social Enterprise Network, which is a platform that advocates socially-minded businesses. Before becoming a member, initiatives are subject to a number of tests to see if they correspond with the values of a social enterprise according to the platform. After it succeeded, De Tweede Jeugd was allowed to put a Social Enterprise Platform stamp on its website. The platforms not only organizes helpful workshops, but they are also actively lobbying for social enterprises in the government. They are currently working on a quality label for social enterprises. Another platform De Tweede Jeugd is a member of is the 'Verspilling is Verrukkelijk' platform. This is a platform for businesses aiming to tackle food waste as well as providing an online market where members showcase their products made from food waste (Verspilling is verrukkelijk, 2020). Alongside the online shop, the platform also has a unique 'Verspilling is Verrukkelijk' shelf in eight supermarkets in Amsterdam. In these supermarkets, De Tweede Jeugd also sells their grilled sandwiches. Lastly, the platform organizes events and campaigns to raise awareness and activate other businesses and consumers to start taking action against food waste. Benjamin acknowledges that these platforms help to give recognition for the work De Tweede Jeugd and similar initiatives do.

Monitoring and evaluation

In terms of monitoring, De Tweede Jeugd keeps track of the amount of bread they collect and the number of grilled sandwiches they sell. Furthermore, they keep track of whom they are selling to and what price they sell the sandwiches for. Over the years, they have also been experimenting with different types of grilled sandwiches. Based on their monitoring, they are able to determine whether a grilled sandwich is selling more or

less than expected. Furthermore, they have had a food truck, a bread shop, and two cafes. "We tried almost everything," Benjamin says.

Drivers and barriers

Drivers

According to Benjamin, money is quintessential in running a successful business and tackling food waste. In his opinion, subsidies could help De Tweede Jeugd grow because it would allow him to hire more people and purchase more products for the production of grilled sandwiches. As a result of this, he would be able to sell more products and have a sustainable basis to hire employees. However, he needs a financial injection to achieve this.

Barriers for De Tweede Jeugd

Major barriers

De Tweede Jeugd also experiences some barriers which hampers the initiative's ability to grow. A political barrier that De Tweede Jeugd experiences is that their organizational structure is not recognized. Currently, the distinction between commercial and non-commercial companies is very strict, while in reality it is not that straightforward. This leaves no room for social enterprises like De Tweede Jeugd, who address a societal problem while also making a profit. This leads to two other barriers, which can be defined as economic and cultural. Because of this clear distinction, Benjamin feels like he is not properly recognized for the work he does and the goals he wants to achieve. Moreover, its commercial activities also affect the Tweede Jeugd's eligibility

for subsidies. "We applied for many different municipal subsidies, but we always get rejected for the same reason. Although we ended up not needing them, you can imagine the possibilities that would have opened up once we would have received 50.000 or 100.000 euros."

In terms of upscaling, De Tweede Jeugd experiences major organizational barriers. Since his partner Manuel left, the production process has been outsourced to Raaskal. In theory, this would give Benjamin more time to pursue other things such as product development and working on new ideas. As it turned out that this is not the case, he is now looking for a new partner. The search for a new partner is, however, limited by money because the outsourcing of the production is costly. This leaves little financial room for finding a new partner. With the organization unable to grow, it proves difficult to scale up the production process and improve the quality of the grilled sandwiches.

Minor barriers

Lastly, as a food business, De Tweede Jeugd has to adhere to regulation when it comes to the production of food products and the handling and storing of food. In contrast to his former partner, Benjamin never really stressed about inspectors checking to see if De Tweede Jeugd did everything according to the rules. De Tweede Jeugd was inspected once when they own a grilled sandwich bar. Apart from a few points of improvement, everything was fine. "It is not that difficult to adhere to regulation, and, in my opinion, it's not that complicated either", Benjamin says. This mainly comes from his experience as a chef, where he learned to handle and store food properly. "If you do your best, store your food properly and keep track of what you

use, you will come a long way." Therefore De Tweede Jeugd does not experience any legal barriers. Moreover, by outsourcing the production, legal barriers are outsourced as well.

Barriers to tackling food waste in general

Major barriers

As mentioned earlier, Benjamin sees the lack of recognition for social enterprises as an essential political barrier for food waste prevention initiatives with commercial activities. Furthermore, although De Tweede Jeugd does not experience any hinder from possible legal barriers, Benjamin believes that many of his colleagues do experience problems. Especially larger companies have much more to do with strict regulations and certificates. "For instance, big bakeries are actually not allowed to freeze their bread for us when they don't put labels on it with the production date. If they want to do this they need to apply for a certificate". Applying for these kinds of certificates takes a long time and is one of the reasons why it takes long for larger companies to change their production process. However, it is not only large food businesses that need certificates, but also smaller businesses selling to supermarkets that need to adhere to strict rules. These rules do not only derive from external regulation, but also from internal rules and standards used by businesses. "Supermarkets adhere to strict rules which they set up themselves. As a result, a bakery selling to these supermarket have to follow the same rules, which is especially the case with Jumbo. If we supply Jumbo we need certificates proving that the food is handled correctly. We have to do temperature checks and so on."

Municipality of Amsterdam

Benjamin thinks that the municipality can help overcome these barriers by providing subsidies. He recognizes that the municipality is actively researching the possibilities to increase their support for initiatives against food waste. Not only are they researching possibilities for subsidies, they are also looking for an official legal form for social enterprises. A critical way to strengthen the relationships between social enterprises, according to Benjamin, would be if the municipality of Amsterdam would become a client and thus really invest in these relationships.

Impact

Environmental impact

Analyzing its impact, De Tweede Jeugd collects about 1300 loaves of bread a month, weighing around 500 grams per bread. In total, this comes down to 650 kg of bread per month and 7,800 kg of bread per year. With this bread, they sell around 4,000 to 5,000 grilled sandwiches per month and about 25,000 crostini's per year.

The environmental footprint of the production of bread to retail (also called cradle-to-retail) is 0.9 kg CO_2-eq. per 1 kg of brown bread and 1 kg CO_2-eq. for white bread (Blonk Consultants, 2019). Since it is unknown how much white and brown bread is being collected, the average of both is calculated. This comes down to 0.95 kg CO_2-eq. per 1 kg of bread, resulting in an environmental impact of 7,410 kg CO_2-eq. per year (see also table 4.1).

Table 4.1: Environmental impact De Tweede Jeugd. Source: author

Indicators	De Tweede Jeugd
Amount of collected bread waste (in kg)	**7,800**
Amount of CO_2-eq. emissions avoided (in kg)	**7,410**

Socio-economic impact

When it comes to raising awareness, De Tweede Jeugd only uses their website (De Tweede Jeugd, n.d.). They mainly use it to communicate their vision, raise awareness for bread waste and show their impact in terms of the number of saved loaves of bread. Apart from their website, De Tweede Jeugd does not actively raise awareness or activate people through other channels. Furthermore, De Tweede Jeugd does not currently engage in forms of social interaction compared to when they owned a food truck, bread shop, and two cafes.

Since De Tweede Jeugd engages in commercial activities it has an economic impact, albeit limited. Aside to a part-time employee, Benjamin currently is the only full-time employee. Nevertheless, De Tweede Jeugd sometimes has temporary part-time employees to package large numbers of crostini's. On top of that, De Tweede Jeugd indirectly provides jobs by outsourcing the production and delivery process. It is difficult to say how many jobs the initiative currently provides. By paying for the leftover bread they save, they also economically support the business they get their bread from. Furthermore, De Tweede Jeugd is a loyal client of local businesses such as Wild van Wild and OH NA MI. Nevertheless, De Tweede Jeugd does not regulate how much their clients ask

for their products. For example, the price of their grilled sandwiches typically ranges between €4.- and €6,50, which means they are not necessarily cheap. However, this highly depends who sells the grilled sandwiches.

4.2 Case 2: Too Good To Go

Too Good To Go

In short: Too Good To Go offers food businesses a platform on which they can sell their leftover food for a discount.

Organizing

Origin of the initiative

The idea of Too Good To Go (TGTG) originates from a group of students in Copenhagen, and was founded upon previous experiences. They were shocked by the amount of food that restaurants typically throw away. In order to address this issue, the group of students decided to start a website to provide restaurants with a platform to sell their leftover food to customers. After they persuaded restaurants to join the platform, it soon became a success. A mobile application was created and quickly franchised to other countries in Europe, such as Germany, France, the United Kingdom, and Norway. Because oversight lacked, the results were mixed. Eventually, an investor saw the potential of the idea and professionalized the organization. An integral part of this was to realize a central company with a central strategy and message, although branched out in different countries. In January 2018, Joost

Rietveld launched TGTG in the Netherlands. He worked and lived in Denmark and got in touch with TGTG, after which he was asked to launch the initiative in the Netherlands. Jurjen de Waal joined TGTG in late 2019 as a food waste campaigner (see appendix C).

Organizational structure

TGTG is officially not a food company but a tech company. According to Jurjen, the TGTG branch in the Netherlands has grown dramatically from a small team of five people to employing about 35 people full-time. More recently, TGTG has also started hiring interns, mainly for handling social media. In the beginning recruitment was mainly done through informal networks. After it had been professionalized, the recruitment process has become more formal with job vacancies offered on the TGTG website. The organization is divided into different sections. Joost Rietveld is the so-called 'country manager'. There is also a sales department which is concerned with bringing in new businesses and an account team, also called the "success team", which supports and maintains relations with the existing partners. Part of the success team is the customer service, which deals with questions and complaints. Every team or department has one responsible person in charge. For significant decisions, all department managers and the country manager come together. For smaller decisions, the manager of that particular department usually makes the decision, according to Jurjen. Nevertheless, he stresses that there is always room for new ideas.

Core values

TGTG started as an initiative against food waste which will always be their main focus: "We are pushing for a world without food waste", according to Jurjen.

Doing

Activities

It all started with the Magic Box, which is, as of today, still their main product. Food businesses fill this box with leftover food products from that given day (about 1 kg) and sell these boxes on the app of TGTG at a reduced rate (about one-third of the original value). The app of TGTG thus functions as a marketplace that brings businesses and consumers together. On every sold box, TGTG withholds a small percentage for their provided service. However, they don't ask any membership fee, which makes it very accessible for food businesses to give it a try.

TGTG does not know what the food businesses put in the Magic Boxes they sell. According to Jurjen, this is an important reason why TGTG has grown significantly in the past two years. "The selling party remains responsible for what they sell. Having them register what type of food they put in the Magic Box would make it very unattractive." The online marketplace thus allows TGTG to be easily scalable because they only provide a service and don't need to set up any logistics. The leftover food remains in the restaurant or cafe and is picked up by the consumers themselves. Another essential reason why TGTG is so scalable is that the app is very accessible for its users, which includes both food businesses and consumers. The application process for food

businesses is quick and straightforward which the account managers guiding them through the system.

Partners, clients and users

TGTG considers the businesses that are using their app not merely as app users but also as their partners. About this, Jurjen says, "together with these businesses, we make sure that food is not thrown away." In Amsterdam alone, TGTG has about 420 partners. While nationwide, TGTG has approximately 4,000 partners and 1.5 million users. Alongside the app, TGTG also has about 300,000 people subscribed to their newsletter and more than 350,000 followers on Facebook and Instagram (Too Good To Go, 2020A).

Framing

Vision for TGTG

TGTG has a global strategy and message which is the same for all TGTG locations. However, in addition to the global strategy every country can draw up their own local strategy. This strategy, however, remains private in order to make sure every TGTG spreads the same message. For the local strategy, all department managers formulate a strategy together. For the short-term vision, TGTG wants to increase its impact in terms of selling more Magic Boxes and starting a campaign that is focused on creating more awareness of food waste. According to Jurjen, food waste in the Netherlands is so significant that increasing the sales of Magic Boxes alone will not solve this problem. Moreover, he believes that the current impact of TGTG is negligible compared to the total amount of food waste in the Netherlands. However, "having this platform allows us to bring people together and

make businesses and people more aware. It provided us with the resources for more research and lobbying.” In short “it allows us to increase our impact", Jurjen states. Therefore TGTG wants to take on activities that go beyond the Magic Boxes, such as helping businesses to become zero-waste or give tips for reducing food waste to households. According to Jurjen, "in the Netherlands, about half of all food waste takes place on a household level." With a userbase of more than 1.5 million people, the app offers a lot of opportunities, such as subtle nudges, to make people more aware of food waste issues. TGTG intends to do the same with its newsletter and social media channels. In addition to spreading information about food waste, TGTG is also looking into setting up workshops and course packages on topics related to food waste. Together with the foundation Samen Tegen Voedselverspilling, they are currently exploring options for workshops and course packages to raise awareness and give people the right tools. Jurjen argues most household food is wasted when buying, cooking and storing it, “so making sure that people don’t cook too much, know how to prepare things, and how to store food properly, is very important”.

For the long-term global vision, TGTG has formulated four goals for four different pillars: households, businesses, education, and politics (Too Good To Go, 2020B). By 2020 TGTG intends to (1) inspire 50 million households, (2) work together with 75,000 businesses, (3) inspire 500 schools, and (4) influence the political agenda of least five countries. TGTG is currently working on a new vision in which a fifth pillar is introduced, namely the marketplace. This marketplace forms the foundation of TGTG and has a direct impact, while around this marketplace, the other four pillars indirectly contribute to avoid food waste. An essential part of this new vision is also to formulate clear,

concise, and measurable goals, which are communicated clearly on the TGTG website. However, this is all still a work in progress. Lastly, on a personal note, Jurjen wants to look into the possibilities to increase social interaction, for instance, by working together with other social initiatives. An example would be to give users of the app the possibility to volunteer at other social initiatives against food waste.

Vision on food waste in general

Working together is the only solution to make a real impact, according to Jurjen. "We know that Albert Heijn alone throws away more food than we collect every year. So I am now looking at how TGTG and ten other initiatives such as De Voedselbank can work together to make Albert Heijn or Jumbo an attractive proposal to collect their leftover food." To work together, however, it is essential to know which initiatives are active in Amsterdam. Jurjen is familiar with most of them and admires the initiatives that bring people together by giving away free food in the form of dinners and free supermarkets. This social aspect is something he would like to integrate more at TGTG.

Knowing

Monitoring and evaluation

When TGTG was taken over by an investor a lot of know-how was injected into the business. This gave the location in the Netherlands a significant head start. As a result, TGTG has an extensive system that monitors the number of partners, their location, how many meals they save (read: number of boxes sold), and their 'save ratio' - which is the number of boxes that are offered on the app and picked up by a customer. The save

ratio has always been above 90% and Jurjen does not know what will happen when this save ratio starts to drop: "We have never experienced such a thing. But of course, we do not want a platform that offers an abundance of food, but that is not sold. That is not very motivating for our partners." A solution might be a temporary stop on signing new partners. Furthermore, TGTG does not collect any data from its users, which means that they do not know how many users Amsterdam has. Nevertheless, it is possible for TGTG to extrapolate data and determine in which cities their users live. This collected information is carefully monitored and continuously fed back for discussion. The save ratio provides a good example. TGTG also receives a lot of feedback from its users. For example, after a lot of businesses wanted to get rid of their sweets during around Christmas time, customers complained about the number of sweets in the boxes. To solve this, TGTG started giving businesses the option to sell a special Magic Box filled with sweets. This turned out to be a great success and shows how TGTG strongly evaluates and moderates their activities.

Knowledge and networks

TGTG shares some information on its website, which is open for everyone, but at the moment, not much information is shared between other social initiatives. However, they intend to make their knowledge accessible to the public in the future. A way to do that is by working together with other initiatives and form a network. Currently, they are a member of the foundation Samen Tegen Voedselverspilling. As already discussed, TGTG is exploring options for workshops with other parties such as Milieucentraal or Het Voedingscentrum.

Drivers and barriers

Drivers

For TGTG, the most critical driver in achieving success is a well-functioning digital infrastructure for their app. According to Jurjen, an important driver for tackling food waste is the knowledge that businesses, households, and politicians have of food waste issues and ways to address these problems. Proper communication of how things work, such as the expiration date, is a critical aspect of spreading this knowledge.

Barriers for TGTG

Major barrier

A major political and cultural barrier that TGTG experiences in their daily operations is the lack of institutional urgency to take measures against food waste.

Minor barriers

Since TGTG operates as a platform, it doesn't experience many legal barriers because it doesn't produce and distribute the food. Nonetheless, TGTG does have its own regulations related to food which limit their activities indirectly. For instance, TGTG has started to work with canteens and caterers. The rules for these types of businesses are clear; all the food they produce has to be sold within two hours. "This is a big challenge because a two-hour window is tight for a caterer to decide whether he is gonna sell a product or not, then offer it on the app, have someone buy it, and collect it", Jurjen says. He understands that these regulations are in place to ensure food safety but mentions that

Denmark found a way to address this problem. In Denmark, these rules were altered from two to four-hours, to give businesses a bigger window.

Lastly, TGTG experiences that some businesses are hesitant to become a partner because they struggle to admit their food waste. "They are scared that, because people will see them on the app, it will damage their reputation", Jurjen explains. TGTG has partly tackled this barrier by not showing exactly how many Magic Boxes they offer, but only an indication of plus five boxes when they have a lot of leftover food. All things considered, Jurjen concludes TGTG itself does not experience that much hinder from these barriers; “there are some practical matters, but everything is manageable at the moment.”

Barriers to tackling food waste in general

Major barriers

According to Jurjen, there are three main barriers to reduce food waste. The first barrier is cultural. Jurjen feels that food waste is severely underestimated in society. Consequently, people have come accustomed to throwing away their food. The second barrier is political as Jurjen thinks that food waste does not have a prominent place on the political agenda. Politicians, businesses and households don’t always possess the right knowledge when it comes to food waste reduction. An example is the expiration date. There are two categories: Tenminste Houdbaar Tot (THT) and Te Gebruiken Tot (TGT) (Voedselbank Amersfoort, 2017). THT means 'best before' while TGT means 'use by'. Products with a TGT date should not be consumed after the given date, while for products with a THT date, people can determine themselves whether it is still consumable. However, according to Jurjen

there is also sub-category within a THT date, that should not be consumed after that date, and thus actually falling into the TGT category. "If it continues to be this complicated, it is not surprising that people throw food away when a product may in fact still be consumable, Jurjen says. The third barrier is economic and political. According to Jurjen, the current political and economic system enable food waste too much: "If you are continuously seduced to buy food, you are eventually buying more food", Jurjen says.

Municipality of Amsterdam

The barriers described by Jurjen operate on a governmental level. Nonetheless, Jurjen does see an important role for the municipality in Amsterdam. Especially in the field of waste and waste separation, the municipality has much room to improve, according to Jurjen. He uses the example of South Korea: "In Korea they started to obligate people to separate their waste, including their food waste. In this system, people pay for the amount of waste they produce. This made people more aware of how much food waste they actually produced. Besides, it gave people a positive incentive to waste less because less waste means fewer costs." In Jurjen's opinion, when it comes to raising awareness, the role of the municipality of Amsterdam is of equal importance as the government's role.

Impact

Environmental impact

Since its start in 2018, TGTG has saved about 290,000 meals in Amsterdam, according to Jurjen. One meal equals one Magic Box, and this equals about 1 kg of food. According to Jurjen, this

is a low estimate, and his assumption is that a Magic Box often contains more than 1 kg. Since there is no information available on the impact of TGTG in 2019, the total amount of meals saved over two years is equally divided over two years. Following these assumptions, TGTG saved 145,000 meals in Amsterdam in 2019, which equals 145,000 kg of food. This comes down to an environmental footprint of 368,300 kg CO_2-eq. (see also table 4.2).

Table 4.2: Environmental impact of TGTG. Source: author

Indicators	TGTG
Amount of collected food waste (in kg)	**145,000**
Number of meals served	**145,000**
Amount of CO_2-eq. emissions avoided (in kg)	**368,300**

Socio-economic impact

When it comes to raising awareness, TGTG offers a lot of information on the topic of food waste on their website (Too Good To Go, 2020). Their online database discusses answers to questions such as: What is food waste? Why is there food waste? What type of food is wasted? These questions are answered concisely, using a lot of quantitative data from research. Additionally, the website also houses a blog, in which news, recipes, and tips for cooking with leftovers or food storage are shared. Especially the blog articles on cooking and storing food help build capacity, albeit limited. Looking at social interaction, TGTG only provides interaction between the buyer and seller. Although the app stimulates people to go to shops and pick up

the Magic Boxes, it does not encourage any social interaction apart from the purchase.

In terms of economic impact, TGTG engages in commercial activities and provides about 35 full-time jobs in the Netherlands. With its Magic Box the company does not only earn money, but also allows food businesses to receive money for the food they would have otherwise discarded. With over 4,000 companies using the app, TGTG has a significant economic impact. Furthermore, with over 1.5 million users, TGTG allows people to buy food with 66% discount on the original value, hence making food more affordable.

4.3 Case 3: De Kaskantine

De Kaskantine is an urban farm and cafe that is off-grid and entirely self-sufficient. It is built using temporal, movable, and self-sufficient units. It produces its own food and energy, and filters its own water. Every weekend De Kaskantine hosts a free pizza night, music night and Sunday brunch made from food waste and home grown food. It also hosts a free supermarket every Friday.

Organizing

Origin of the initiative

Menno Houtstra (see appendix C) and his partner started De Kaskantine in 2013. De Kaskantine is an urban farm and cafe that is off-grid and entirely self-sufficient. It sets up shop at derelict grounds that will be developed within two or three years. To make optimal use of this ground, project developers allow De Kaskantine to set up the initiative temporarily. To be able to move to different locations, De Kaskantine's building consists of temporal, movable, and self-sufficient units (De Kaskantine, 2020). Since De Kaskantine started in 2013, it has already moved four times. Menno and his friend founded the initiative based on their working experience in the food industry. Menno has a background in irrigation systems and rural development. He

worked as a chef in France, where he learned the importance of local resources. This was also the idea behind De Kaskantine. "Starting a project that only uses local resources. In a city, this is mainly waste, which is not used at all. This is especially the case with food waste." Menno says. Besides using local resources, another aim of De Kaskantine is to show the possibilities to be off-grid and thus entirely self-sufficient in terms of energy, water, and materials, even within the city. This is what Menno calls the alternative economy in which people are self-sufficient. Due to Menno's time living in France, De Kaskantine originally started as a french lunchroom and was completely off-grid, using local resources, growing food, and generating energy and water.

Organizational structure

De Kaskantine's legal form is a cooperative. It has a board consisting of two board members who are responsible for all operations of De Kaskantine. Menno is one of the board members as well as the main contact person. Besides the board members, the initiative also consists of many different "space users". It allows its members to use space for their own projects, as long as it's off-grid. Coming to decisions is very organic, according to Menno. "We are a cooperative, so everyone is open to speak their mind and decisions are always made in deliberation."

The core team consists of five to seven volunteers per day, although sometimes close to 20 volunteers in case there is a major event. There is also a garden team consisting of five people, a solar energy team consisting of four people, and a building team consisting of four people. Every team works two times a week. Additionally, every week ten people work at the

Voedselkringloop, where they help to collect and sort food and clean afterwards.

Core values

The core value of De Kaskantine is to be self-sufficient and have as little expenses as possible.

Doing

Activities

De Kaskantine engages in many different activities. It started as a lunchroom, after which it quickly transformed into an urban farm and cafe. "We noticed that people were very interested in our setup", Menno says. In their garden, they cultivate food using aquaponics, specialized growth systems, composting, and green roofs. Furthermore, they use solar panels and batteries to generate power and a filtration system to filter and collect rainwater. During the winter De Kaskantine is heated by burning wood in rocket stoves. De Kaskantine hosts events every weekend which attract many people, such as a pizza night on Friday, a music night on Saturday, and a vegan brunch on Sunday. Much of the food used for these events comes from leftover food which would otherwise be wasted or food grown in their own garden. For the pizza night, only the flour is bought at the store, while all other ingredients such as vegetables come from food waste. All food De Kaskantine serves during these events, except for drinks, is paid for on a donation basis. Drinks are purchased at local supermarkets and breweries. In addition to their weekly events, De Kaskantine also organizes a free supermarket every Friday. This free supermarket is called the 'Voedselkringloop' and predominantly offers vegetables, fruit,

and bread, but sometimes also meat or cheese. De Kaskantine collects this food three times a week at the local Albert Heijn at Delflandplein and two times a week at the Food Center Amsterdam. What remains uncollected at the Voedselkringloop is put in the freezer for volunteers at De Kaskantine to collect.

Besides providing a space for people to cultivate food, eat, drink, and do groceries, De Kaskantine is also a politically engaged. After having moved three times already, De Kaskantine is now setting up shop at the Handbalweg in Amsterdam-West. In contrast to the previous locations, this location allows De Kaskantine to stay for at least seven years. "Our concept has always been to stay somewhere for five to ten years, but until now, we had to move every two years. All the money we earned with donations is then used to move to a different location", Menno says. However, in order to stay for seven years, De Kaskantine needs to pay rent for the ground they use. Typically, the rent is based on the costs for the municipality to make the ground ready for use, such as connecting the ground to water and electricity. Furthermore, the rent price is also determined based on how the land will be used, for instance, for private or public use. Menno says that for an off-grid initiative like De Kaskantine, these costs are zero. Therefore, Menno is now lobbying for new regulations for off-grid initiatives so that De Kaskantine does not have to pay any rent.

Lastly, De Kaskantine also organizes workshops at community centers to raise more awareness of self-sufficiency and food waste. Examples are workshops on composting at home, such as making worm hotels. These workshops are not only aimed at sharing knowledge but also at raising awareness of food waste. Complementary to the workshops, De Kaskantine also develops do-it-yourself kits.

Partners, clients and users

Table 4.3 illustrates the partners and users of De Kaskantine. It uses various partners for collecting food. Furthermore it uses Wijkcentrum Het Anker as a location for its workshops. With their activities De Kaskantine attracts about 1,000 people per week. These activities includes the supermarket, workshops and diners.

Table 4.3: Partners of De Kaskantine. Source: author

Activities	Partners
Collecting food	Albert Heijn (Delflandplein) Food Center: Crisp, FRESH Food, Rustenburg en zn, Loogman and a mushroom farmer. Local breweries: Fiekens bier
Workshops	Wijkcentrum Het Anker

Framing

Vision for De Kaskantine

The ultimate goal of De Kaskantine is to create new ways of living in an alternative economy. According to Menno, this is more an issue about materials. "It is about having people produce more things themselves, so that people will act less as a consumer and more as a producer", Menno says. Being more self-sufficient, and thus less dependent on the mainstream economy would allow people to work four days a week instead of five days.

With the money De Kaskantine receives from donations, it aims to promote this alternative economy. Community centers play a vital role in raising more awareness for this new economy. These

centers are close to the people and thus have great potential to spread knowledge and tools to achieve an alternative economy together. Menno argues that many examples in which community centers play a vital role have proven successful, such as repair cafes.

Vision on food waste in general

According to Menno, making people more aware of food waste is the only solution. In his experience, De Kaskantine and some other initiatives like Guerilla Kitchen, are the only ones that taking practical matters. He calls initiatives like Guerilla kitchen a 'signaleringskeuken'. These kinds of initiatives address issues by taking action in order to create awareness while also serving as an example for individuals. “Measuring the impact is not about some technical figure, it is about signaling a problem and creating awareness. That is what matters", Menno explains.

Menno believes that online platforms such as Too Good To Go will not achieve systemic change. However, he does believe that food businesses could save up to 50% of food waste using a ‘smart’ approach, such as better packaging and administration. While Too Good To Go’s smart approach helps food businesses in the last step of their food chain, Menno argues that it merely introduces a different way of consuming and that it does not change how food businesses handle their food.

Knowing

Knowledge and networks

As said, De Kaskantine was founded on past experience of Menno and his partner. Menno has working experience as a chef

and learned about irrigation systems and rural development through his studies.

Monitoring and evaluation

De Kaskantine does not monitor how much food they collect or how many visitors they have as Menno does not find this very relevant. Mainly because he does not believe in their impact in terms of quantity. Nonetheless, De Kaskantine is continuously experimenting with new ways of doing, which are always evaluated on their effectiveness.

Drivers and barriers

Drivers

As mentioned above, Menno believes that it is only possible to achieve systemic change by making people more aware of the problem on the local level such as community centers. However, until recently, they never saw any role for themselves when it comes to issues around sustainability. By making people more aware of food waste and by giving these people tools to become more self-sufficient Menno believes that they will influence local politics. Through their work, they want to change politicians' perspectives and help introduce new policies, and in doing so, eventually realize systemic change.

Barriers for De Kaskantine

Major barriers

De Kaskantine is actively lobbying for new regulations for off-grid initiatives. In doing so, De Kaskantine experiences significant

political barriers that hinder them in their work. As explained above, De Kaskantine is now lobbying for a new type of contract that acquits them from paying rent. During this fight, Menno realized that the real estate department of the municipality, who determine the rent levels for urban land, is only focused on making money. "I do not know anyone in the real estate department, so I do not know how their world works", Menno says. Without an insider, lobbying for new regulations is difficult according to Menno. Menno and his colleagues lobbied for many different plots of land to settle, such as De Bretten, Luttikkermeerpolder, IJmeer, and the Food Center, but they received many rejections. A particularly illustrative example was their plan for the Food Center (a major distribution center in Amsterdam) together with, amongst others, Guerilla Kitchen, where they wanted to collect food waste from the companies located there in order to redistribute it. "That was something where we could have made a real impact. I was the main driver behind that plan, and everything was already in an advanced stage. We had a board and already founded a cooperative. However, it ended just horribly." The real estate department rejected these plans for various reasons. Nevertheless, Menno remains relatively optimistic about his chances, especially since the local council has agreed to examine the possibilities for off-grid contracts. This was requested by the city district Nieuw-West, who is unanimously supporting De Kaskantine. When it comes to food waste prevention initiatives realizing systemic change, he is somewhat pessimistic. "It seems that the only solution is an administrative exception for De Kaskantine." Menno says.

As explained, the rent level is also determined by how the land will be used, such as private (for commercial activities) or public (for social activities). However, since De Kaskantine engages in

different types of activities such as gardening, catering, water filtering, and energy production, it is challenging to put De Kaskantine in one single category for land use. What makes it even more complicated is that private and public land use have different rent levels. For example, using land for social activities costs 10 euro's per m2 per year, while for commercial activities, this is 100 euro's per m2 per year. De Kaskantine currently occupies about 500m2 of land, most of it is for social purposes. However, De Kaskantine also engages in the commercial activity of selling drinks. Because De Kaskantine wants everyone to eat and drink wherever they want, it means that they will be categorized as commercial, which will result in a yearly rent of more than 50,000 euros. De Kaskantine cannot afford this much money. Moreover, based on their income last year, they would be able to pay a yearly rent of 5,000 euros. This would only allow for 50m2 of catering space. "That would be a tiny restaurant that barely fits 20 people. This already costs 5,000 euros. This is a lot of money, especially considering the fact that we do everything based on donations", Menno states. In order for De Kaskantine to be able to stay at their current location, it needs to be categorized as mixed land use, which allows affordable rent. In doing so, the municipality has to create a mixed land use category. "Alternatively, we would have to become more commercial and start asking more money", Menno says. The fact that there is no mixed land use category in place at the moment thus creates an economic barrier for De Kaskantine.

Minor barriers

De Kaskantine also experiences a cultural barrier when it comes to collecting food waste. Menno calls this an "ideological fight". For example, Menno experienced the companies at the Food Center as being very conservative. There are about 30

companies located in the Food Center, and most of these companies are not happy with initiatives like De Kaskantine collecting food. They didn't like the idea of giving their food away for free, while simultaneously trying to sell it on the market. Furthermore, De Kaskantine also experiences political barriers such as their inability to receive subsidies because they sell drinks. Lastly, De Kaskantine does not experience any legal barriers, although they are not connected to the sewage system. This is something an enforcer could see as a potential problem, but until this day, this has not happened.

Barriers to tackling food waste in general

Major barriers

Menno considers the lack of knowledge about the size and impact of food waste as the most significant barrier. "There are too many ways to pass on the ecological and social costs of the food production on the environment and society," Menno argues. It is clear to him that the current political system will not be able to change this in order to keep these costs in the economic system. Menno sees that people are currently losing touch with the production process of food. Consequently, people are unable to gauge the negative impact of the production process. Moreover, without understanding the harm that the production process creates, politicians will not receive much support when taking measures against it. Menno states that "it is evident for everybody that climate change is happening, yet the political system is unable to provide the answers. Mainly because there is no support in society to take any measures. Why is there no support? Because people are only acting as a consumer which makes it impossible for them to imagine what the negative impacts are of the current production system." According to

Menno, the only way to make people understand these adverse effects is to bring them closer to home.

Municipality of Amsterdam

Menno does not believe that the government has enough power to change anything. Nevertheless, he believes that the municipality has the potential to force food businesses to reduce their waste. A possible solution would be to increase tax rates on food waste, which will lower the amount of food waste for businesses. In theory, the municipality of Amsterdam has the rights instruments to stimulate businesses to produce less food waste. However, the question remains if they have enough power to implement measures.

Impact

Environmental impact

From January until September last year, De Kaskantine was opened. During these months, De Kaskantine collected 600 kg food per week. From October until December, De Kaskantine was closed for the public, but the Voedselkringloop remained open. During these months, De Kaskantine collected 400 kg of food per week. See table 4.4 for total environmental impact.

Table 4.4: Environmental impact De Kaskantine. Source: author

Indicators	January - September	October - December	Total amount
Amount of collected food waste (in kg)	23,400	5,200	28,600
Amount of CO_2-eq. emissions avoided (in kg)	58,500	13,000	71,500

Socio-economic impact

With over 1,000 guests per week, De Kaskantine has a significant social and economic impact. With a pizza night, music night, and Sunday brunch De Kaskantine brings many people together every week and stimulates social interaction. Considering awareness on the topic of food waste, De Kaskantine stimulates that by showing their guests how they are self-sufficient. As Menno said earlier, people were more interested in how De Kaskantine is set up, than they were interested in De Kaskantine's food. De Kaskantine thus serves as an inspiration for people to be more self-sufficient. Moreover, on their website, De Kaskantine also offers detailed information on how De Kaskantine is set up. Additionally, De Kaskantine also offers workshops and do-it-yourself kits in order to build people's capacity. By doing these workshops and selling the do-it-yourself kits, De Kaskantine activates people to take measures to prevent food waste themselves. In terms of economic impact, De Kaskantine mainly runs on volunteers, and almost everything, except for the drinks, is sold on a donation basis. Consequently, it does not provide any paid jobs. However, it does make food more affordable for more than 1,000 people a week by hosting free dinners and a free supermarket.

4.4 Case 4: Healthy & Affordable

Healthy & Affordable is a food waste prevention initiative that is predominantly concerned with dehydration of leftover vegetables and fruits. Leftover fruits are dehydrated and then mixed with nuts and/or chocolates, while vegetables are dehydrated into different sorts of powders.

Organizing

Origin of the initiative

Coby Babani (see appendix C) started Healthy & Affordable in June 2014. It was founded on previous experiences, but Healthy & Affordable was not initially focused on preventing food waste. He realized that being vegan and having limited lunchtime means limited choice for fast vegan options. Therefore Coby started an initiative that was focused on providing fast, healthy, and vegan meals for lunch. He experimented with recipes and started selling this on the online platform Thuisafgehaald. When Coby started working on topics related to food waste professionally, he realized that using food waste will make his products more affordable. That is how Healthy & Affordable became a food waste initiative. Coby states that "it became much

more important to me while I got exposed to the amount of food being wasted".

Organizational structure

Healthy & Affordable's legal form is a one-person business. The team working at Healthy & Affordable consists of two people, Coby and Vlad. Vlad is an intern and also coordinates the activities of Healthy & Affordable. He is paid by the European Union through 'Erasmus Intern'. Coby supports Vlad in his work as a coordinator and helps with making decisions. However, the Healthy & Affordable team is also supported by people working at Sapient Social & Environmental Enterprises, a social business also founded by Coby. Sapient Social & Environmental Enterprises (2017) supports initiatives like Healthy & Affordable to achieve its goals by providing services such as recruiting interns, design, and handling social media.

Healthy & Affordable meets at least once a week to discuss how they are doing and how to move forward. The team usually consists of Coby and Vlad from Healthy & Affordable, and a designer, salesperson, talent person, and social media person from Sapient. All in all, six to seven people are working actively on Healthy & Affordable every week. Coby and Vlad work on Healthy & Affordable on a daily basis. The coordinator usually makes a lot of daily decisions, and more significant decisions are made during the weekly meetings with the whole team. "So everything is really organic. Everyone from the Sapient team is always welcome to join the team for a brainstorming session. Things are very flexible. We provide a lot of freedom and responsibility", Coby says about the decision making process at Healthy & Affordable.

Core values

The core value of Healthy & Affordable is to prevent food waste, despite the name of the initiative seems to suggest. “So if we need to sell it more for more, it does not matter. If it is not that healthy because we started collecting a lot of chocolate, then it does not matter as well," Coby argues.

Doing

Activities

Healthy & Affordable is mainly concerned with the dehydration of fruits and vegetables. The vegetables are dehydrated into powders, for instance, paprika powder. The fruits are dehydrated and then mixed with nuts and chocolate or sold separately. Currently, they offer three different kinds of products: (1) small packages (100 grams) of mixed dried fruits, chocolates, and nuts, (2) small packages (100 grams) of chocolates mixed with a variety of nuts, and (3) five different powder flavors: parsley, mint, mushroom red paprika, and green paprika. "So we make different kinds of products that are mostly from things that last for long such as chocolates, nuts, dried fruits, and powders." Coby says. In addition to making products, Healthy & Affordable also does catering for events organized by Sapient Social and Environmental Enterprises.

Healthy & Affordable makes all its products from food waste. The collection of this food waste is not very structured. Healthy & Affordable does not always collect from the same supplier. The fruits and vegetables are collected every Wednesday at the Food Center. The nuts are collected every three months from the same supplier. For the chocolate Healthy & Affordable does not have a

fixed supplier. Healthy & Affordable offers its products on an online platform called Boeren & Buren. This is an online market on which people can order products five days a week. Coby explains how this system works as follows: "You order it, and then you come and pick it up in something which looks like a market. However, no money is exchanged, and that is why it is legal to do it. You cannot just open your own market. You need to ask permission from the city hall." The reason why Healthy & Affordable does not sell its products for a fixed price is that they need an exclusive license to do so. "We sell it, but at the moment it is donation based because we do not have a 'horeca' license. So, we can only give stuff on donation basis or for free." There are many different 'market collection points' of Boeren & Buren, which are all open on different days during the week. Apart from the Boeren & Buren platform, Healthy & Affordable products can also be found at cinema Het Ketelhuis and escape room Logic Locks.

Partners, clients and users

Healthy & Affordable mainly collects its food from five partners located in the Food Center. Additionally, they also collect from an unnamed nut supplier every three months. Sapient Social and Environmental Enterprises is their partner for catering. Lastly, as mentioned above, Healthy and Affordable markets its products with the help of Boeren & Buren, Het Ketelhuis, and Escape Room Logic Locks. Table 4.5 illustrates the partners of Healthy & Affordable. Healthy & Affordable does not have any detailed information on their number of sales.

Table 4.5: Partners of Healthy & Affordable. Source: author

Activities	Partners
Collecting food	Food Center: Crisp, FRESH Food, Rustenburg en zn, Loogman and a mushroom farmer. An unnamed nut seller
Catering	Sapient Social and Environmental Enterprises
Selling	Boeren en Buren, Het Ketelhuis and Escape room Logic Locks

Framing

Vision for Healthy & Affordable

For the short-term, Healthy & Affordable wants to save more food, dehydrate more, and sell more products. In order to do that, the initiative needs more volunteers. Therefore they are organizing a volunteer event to persuade people to join as a volunteer. The goal is to have around 40 to 50 volunteers eventually. Furthermore, they want to to equip the volunteers that will help pick up the food with branded shirts, jackets, and bikes with the Healthy & Affordable logo. "You have the codes to unlock the bakfiets, you know the shops, the route, and you just do it." This will also allow Coby and Vlad to focus on other tasks rather than collecting food. Aside from getting more volunteers on board, Coby also wants to hire more interns using Erasmus Intern by creating a more systemic hiring system. Lastly, they also want to start organizing an internal onboarding program for new volunteers and interns in order to make them familiar with the story of Healthy & Affordable.

For the long-term, Coby wants to professionalize Healthy & Affordable by setting up a company. For the long term, Coby states that "he want to grow staff-wise". "Instead of people from Sapient working for Healthy & Affordable, we want a designer/ sales person who will have its own team and project."

Vision on food waste in general

According to Coby, the Netherlands is the biggest producer of food waste in Europe because of its intense agriculture and the port of Rotterdam. First, as an export country, the Netherlands produces more food than its people consume. Coby points out that research shows that farmers usually waste between 15% to 60% of their produce because of undesired shapes, sizes, and colors. Hence, the more farmers produce, the higher the amount of food waste. Second, the port of Rotterdam functions as continental Europe's gateway for food. "Most of the food to Europe that comes from abroad comes through the port of Rotterdam. It comes from South America, Asia, Africa etcetera. It doesn't come by plane because it is too costly. However, there is a lot of waste at the point of entry. Sometimes containers get breached because they get insects, or it could be that the company did not come to pick it up, or that it did not pass customs for other reasons, or the communication was not clear." With these sentiments Coby refers to issues regarding unsold food that is being wasted. When food arrives at the port of Rotterdam so-called 'pushers' negotiate a price between the exporter and retail businesses like Albert Heijn and Dirk. Coby argues that "the reason they are called pushers is that they try to push more food down the European throat than Europe can eat". Moreover, Coby argues that the Dutch government is making money from taxes on imported food such as rent extraction and transportation. "All of these people pay taxes, no

matter what happens to the food. The fact that it arrives here means we are making a shitload of money on that food. It does not matter what happens to it" Coby says. Therefore it is also complicated for the government to tackle this problem.

According to Coby, raising awareness of food waste is one thing that initiatives against food waste can do. However, changing the system requires legislation and hard work from the government. According to Coby, this is not yet happening on a big enough scale. Looking at what Healthy & Affordable is currently doing, Coby asks himself if it matters at all. "We take care of not only the symptom of the disease, but we also take care of the symptom of the symptom of the system of the symptom". He sometimes wonders if there are food waste initiatives that think they really have an impact. Nonetheless, Coby still sees a role for food waste initiatives in creating more awareness.

Looking at initiatives that are more commercially-minded, Coby is somewhat skeptical. It is essential to note that the industry of food waste initiatives is different compared to other industries. Companies are typically focused on sustaining themselves. However, when food waste initiatives achieve their desired systemic change, they are no longer necessary. The key is to stay motivated which can become challenging as the years go by. Many people lose motivation, and therefore, many initiatives die. Luckily, Coby sponsors Healthy & Affordable with another job and will continue to do that as long as he is still motivated to do so. "I am quite amazed and proud that we are still sustaining ourselves after five years. An essential part of it was that I was always very relaxed about our progress, and I was not about making an income from it."

Knowing

Knowledge and networks

As said, Healthy & Affordable was founded on Coby's past experiences working in the food industry. Aside from Healthy & Affordable, Coby also founded Food Circle, a network for food waste initiatives, and Sapient Social and Environmental Enterprises. As he studied International Business Management, it felt natural to start his own business. Along the way, Coby worked at many different companies and gained much experience along the way. Plus, Coby is also a board member at Taste Before You Waste since 2016.

In addition to the expertise of Coby, Healthy & Affordable also uses the expertise of new interns, volunteers, and employees of Sapient. Healthy & Affordable also uses academic research to justify their decisions. Lastly, Healthy & Affordable uses their website and social media channels, such as LinkedIn, to notify people what they are currently working on (Healthy & Affordable, 2020). They use social media, for instance, to inform people about new types of flavored powders.

Monitoring and evaluation

By meeting once a week, Healthy & Affordable continuously evaluates its activities. The meeting is also used to re-evaluate how they are moving forward. Furthermore, Healthy & Affordable is always experimenting with new products related to dehydration. The powders, for instance, were subject to a long period of experimentation, after which the five best flavors were eventually selected to produce on a bigger scale. Nonetheless,

the process of decision-making remains very informal as everyone is invited to speak their minds.

When it comes to monitoring, Healthy & Affordable has had a short period in which it monitored how much food was collected. If it were up to Coby, Healthy & Affordable would start doing this again if they would have the right facilities to do so. However, as the main purpose is to save as much food as possible, the process of monitoring is very time consuming hinders the process of collecting food. Nevertheless, Coby emphasizes that impact measurement is critical yet not possible at this point for Healthy & Affordable.

Drivers and barriers

Drivers

As mentioned before, Coby thinks that motivation and awareness are primary drivers in tackling food waste. Motivation is needed for food waste initiatives to keep pushing for a world without food waste. Awareness is necessary to change how people handle food at home. However, when it comes to realizing systemic change, he thinks that new legislation is required from the government and municipalities. Lastly, Coby does not believe that funding food waste initiatives is the answer because he thinks none of the food waste initiatives can achieve systematic change.

Barriers for Healthy & Affordable

Major barriers

About the barriers Healthy & Affordable faces, Coby is clear: "Probably the biggest problem is that there are too many problems (...). Food waste organizations have problems in their whole chain. There are complications in everything." Especially the logistical chain of collecting food and distributing products is difficult for Healthy & Affordable. The two barriers underlying this problem are economical and organizational. The main economic barrier is a lack of income. Without a steady income, Healthy & Affordable relies primarily on volunteers and interns. This simultaneously encompasses a major organizational barrier, namely that volunteers and interns come and go while they always need to be trained. Training new volunteers and interns is a very time-consuming process. Additionally, Coby argues that it is tricky to build relationship when their volunteer basis is continuously changing. As a result, food businesses always see different faces when a volunteer comes to pick up leftover food, which means that volunteers constantly have to explain which organization they work for. To address this issue, Healthy & Affordable uses Erasmus Intern to ensure a steady flow of volunteers, branded jackets and shirts to be more recognizable, as well as an onboarding program for volunteers and interns.

Minor barriers

In building relations, Healthy & Affordable also experiences a cultural barrier. Coby feels that there are still many businesses that do not care about food waste. "They feel like doing you a favor by giving you the food."

Barriers to tackling food waste in general

Major barriers

A major barrier experienced by food waste initiatives is a cultural barrier. In the case if Healthy & Affordable, Coby recognizes a value-disorder which lies at the root of the problem. "People do not respect food because it is very cheap." For example, in countries such as Congo there is no food waste because there is a food shortage. Since the Netherlands is a very spoiled country, Coby sees that wasting food has become part of this mentality. As mentioned previously, Coby also thinks that maintaining motivation is a potential barrier to the existence of food waste initiatives. "The amount of motivation you need for it is very difficult to sustain. Many initiatives close down because they cannot find a way to deal with these problems or because they don't want to be commercial." Lastly, a legal barrier that Coby has experienced many times is that supermarkets are not always aware of regulation surrounding food waste. Many supermarkets don't know that they are allowed to donate their food as a gift when it is about to be wasted. A common argument is that supermarkets cannot guarantee food quality. However, when gifting the food, they cannot be held accountable anymore. As supermarket are unaware, they rather throw away their food than risk being sued. This is also the very reason why Healthy & Affordable is not selling their products for money because they cannot guarantee entirely that their products adhere to health standards.

Municipality of Amsterdam

Coby does not see a way for the municipality of Amsterdam or the government to change anything. A possible solution might be

to raise taxes on food, whether it is produced in the Netherlands or not. This might change the way people and businesses are currently handling food, although Coby remains skeptical. As the food sector will suffer significant losses he thinks that this measure will never be implemented.

Impact

Environmental impact

In 2019 Healthy & Affordable collected food every Wednesday from January until August after which it took a break from September until November. It started collecting food again in December. During these months, they collected 100 kg food per week. See table 4.6 for the environmental impact of Healthy & Affordable over 2019.

Table 4.6: Environmental impact of Healthy & Affordable. Source: author

Indicators	Healthy & Affordable
Amount of collected food waste (in kg)	**3,600**
Amount of CO_2-eq. emissions avoided (in kg)	**9,000**

Socio-economic impact

Apart from the production of powders and mixed packages, Healthy & Affordable does not focus on raising awareness or stimulating social interaction. On their website, Healthy & Affordable briefly gives some information about why food waste is an important topic. Apart from this it does not engage in activities to build capacity. Nonetheless, the intern Vlad is

gaining experience from his internship at Healthy & Affordable. Furthermore, Healthy & Affordable does not use any volunteers at the moment. As Healthy & Affordable only sells their products to a few businesses, this is the only social interaction which is being stimulated. Since all products are on a donation basis, customers can determine the price themselves and thus set a price that is affordable for them. Furthermore, Healthy & Affordable uses Erasmus Intern to pay their intern. However, apart from this intern, there are no other people working or volunteering at Healthy & Affordable. The people working at Sapient Social and Environmental Enterprises are not included here.

4.5 Case 5: Taste Before You Waste

Taste Before You Waste is a food waste prevention initiative that organizes so-called wasteless diners made from food waste and a small free supermarket. Additionally, Taste Before You Waste also organizes workshops around the topic of food waste.

Organizing

Origin of the initiative

Luana Caretto officially founded Taste Before You Waste (TBYW) in 2016 (Taste Before You Waste, 2019). However, the original idea started in 2012. After watching a documentary about food waste, Luana realized that food waste was a severe problem. She started an alternative for De Voedselbank, and with the help of friends and a cargo bike, TBYW quickly grew as an organization. After graduating in 2016, Luana was at a crossing: start a regular job and have less time for TBYW or entirely focus on professionalizing TBYW as an organization. Luana eventually chose the latter, and that is why TBYW officially became a foundation in 2016. Over the years, TBYW gradually grew as an organization and started hosting more activities. For two years, TBYW rents a floor in Dokhuis, a community center in the East of Amsterdam.

Organizational structure

The legal form of TBYW is a foundation. It currently employs one paid employee: coordinator Isabel (see appendix C). The organizational structure has multiple layers: (1) A board that consists of 3 members, including founder Luana. (2) The coordinator, which is Isabel. (3) A team of 8 interns, who all have different responsibilities. (4) A fluctuating pool of volunteers ranging from 60 to 70 people.

The coordinator and interns meet every week on Tuesday. These meetings primarily aim to give each other feedback. The interns make their own decisions when it comes to daily operations. Regarding more significant decisions, such as moving locations or changing an activity, the coordinator is responsible and also needs the approval of the board. Therefore the decision-making process is informal for smaller decisions and formal for significant decisions.

As the coordinator of TBYW, Isabel is mainly concerned with communications, guiding the interns, coordinating the volunteers, and the collection of food. She has a contract for 20 hours per week. The interns have a contract for 10 to 12 hours per week and stay on for about half a year. However, after their internship, they often stay involved with TBYW as a volunteer. The interns all have different responsibilities ranging from the coordination of dinners to raising funds. The volunteers help with preparing dinners and free supermarkets. They can sign up online and decide which shift they want to volunteer. There is always someone that is in charge of the kitchen. This person is usually an (ex-)chef. "Sometimes, you have volunteers who have become so accustomed to preparing dinners that they become in

charge of the kitchen. Which I think is really lovely because they have come full circle." Isabel says.

Core values

The core value of TBYW is to prevent food waste by raising awareness about food waste. It tries to raise this awareness with various activities that focus on the individual because it believes that creating awareness is only possible by educating the individual. Isabel also believes that the social and community aspect is an essential factor in successfully changing people's perception and ultimately achieving systemic change. "I like to think that Taste Before You Waste is educational at heart, but by doing it in a fun way." Isabel says. Therefore, TBYW does not focus on the waste it collects in terms of quantity. In contrast, it concentrates on visualizing how much food people are wasting and what people can do to prevent this.

Doing

Activities

TBYW's main activities take place from Monday to Wednesday at Dokhuis, where it rents a floor that includes a kitchen and podium. TBYW rents the space for three days per week at a reduced rate." We have been part of the Plantage Dok/Dokhuis community consistently, and that is why we have a specific agreement" Isabel explains.

On Mondays, there is a wasteless diner with a cultural event (music or readings). On Tuesdays, TBYW hosts a small free supermarket with vegetables and, if possible, a workshop. However, the workshops are still very irregular. Lastly, on

Wednesday, there is another wasteless diner. Important to note is that all served meals at the diners are vegan. The diners and supermarkets are on a donation basis, and everyone is welcome to join. There is virtually always enough food for all their guests. In addition to these activities, TBYW sometimes does catering for businesses and gives workshops on food waste and food waste prevention. For example, a workshop on how to make Kimchi. The workshops are not always free. Isabel explains that "Because it takes up a lot of resources to run certain shows. You have to make sure that people are getting quality experience, and there are enough resources for everyone." Therefore not every workshop uses food waste. Lastly, TBYW recently started with what they call "feeding the movement". This activity means that it is supporting other initiatives fighting for the environment and, for example, supplying Extinction Rebellion with food for their rallies.

Regarding the collection of food for their activities, Isabel is responsible. TBYW mainly collects from small vendors and grocers in the Javastraat using a cargo bike. Most food that is collected is fresh. However, sometimes it also collects some packaged food. Isabel never worries if she will collect enough food. "Usually, by going to the first three grocers, the bike is already full." Isabel explains. However, Isabel mentions that she sometimes worries if the collected food makes up a proper meal. The food that remains unused is offered at the diners or saved for the free supermarket.

Partners, clients and users

All current partners trace back to the period Luana started TBYW. The partners for the collection of food were set-up when Luana was doing the collection of food herself, while the current

location of TBYW, Dokhuis, is also from Luana's old network. As said, this location allows TBYW to organize their activities. Concerning the collection of food waste, TBYW collects from six grocers in the Javastraat, and an unspecified canteen. Every week an average of 48 people attends the diner on Monday, about 10 people attend the supermarket on Tuesday, and 67 people attend the Wednesday diner. In sum, TBYW organized 155 activities in 2019.

Framing

Vision for TBYW

For the short-term, TBYW wants to expand on two activities: the wasteless diners and "feeding the movement". Due to their contract with Dokhuis, TBYW is now open three days a week. Therefore, it is not possible to host an extra diner on a Thursday or Friday. Therefore Isabel wants to start expanding into local community spaces and start a diner there. In doing so, TBYW makes sure to collect food waste, and takes care of the diner. "It is crazy to realize that going to two stores is already enough. This means that small diners do not need that many partners." Isabel says. Eventually, Isabel hopes that people from the neighborhood take charge of the diners. "They can continue to collect either from vendors on the street or from the people we already go to". Although these activities are all under the TBYW brand, and it looks like franchising, Isabel says this is not a target of TBYW. Furthermore, TBYW wants to increase its support for activist groups such as Extinction Rebellion.

Concerning the long-term vision, TBYW wants to branch out on its number of workshops, especially the ones around food waste

and food waste prevention. Isabel says that many businesses have reached out to TBYW to do a workshop.

Vision on food waste in general

First of all, Isabel believes that the main issue around food waste lies within the supermarkets. "A lot of companies and supermarkets blamed the consumer. That is another marketing idea. The whole food system itself is the most wasteful at either side of the supermarket. So at the production and the consumer level." According to Isabel, supermarkets set the standard on what the customer desires, such as specific shapes and sizes. "So if they reject like all these wonky carrots from the producer, the producer has no other option than to discard these carrots." Isabel says. Therefore Isabel argues that it is imperative to make people more aware of how faulty the current food system, especially the middle section of the chain.

Furthermore, as said, TBYW is more concerned with raising awareness of food waste and food waste prevention than the amount of food it collects. It sees the food collection merely as a tool to educate people on how the food system works and to make them more aware of these issues. This idea contrasts with how other initiatives, such as TGTG and Guerrilla Kitchen, work. These initiatives are primarily concerned with the collection of food waste, and try to raise some awareness in doing so. However, Isabel believes that collecting food waste is just a plaster on the wound. She argues that many people are not smart enough to take lessons from receiving food for free or with a discount. Therefore, Isabel believes that these initiatives need to go beyond the collection of food waste and start doing more on raising awareness to increase their impact.

Knowing

Knowledge and networks

As said, TBYW is founded upon the previous experiences of Luana. After she stepped down, different coordinators fulfilled her role. Since January 2020, Isabel started as the coordinator of TBYW. Isabel mainly gained experience during her two internships at TBYW. During her first internship, she was responsible for the cultural program at TBYW. During her second internship, Isabel learned from the previous coordinator Lara. Before that, she did a bachelor in Ancient History and Film, and a masters in Comparative Cultural Analysis.

Isabel now uses the experience from her internships to coordinate all the activities of TBYW. The interns make use of this experience, while each intern also brings in his or her own experience. The interns use this experience to make their own decisions when it comes to smaller, day-to-day decisions. When it comes to more significant decisions, Isabel is involved, and sometimes the board is involved as well. The board also has much experience, especially Luana, the founder of TBYW. Together with the board, Isabel makes sure that TBYW stays true to itself and its values.

When it comes to sharing knowledge, Isabel believes there is room for improvement, especially with regards to sharing knowledge among the different food waste initiatives. Currently, TBYW shares its knowledge through its social media channels and workshops. However, Isabel mentions that most of the people that join the diners or sign up as volunteers come from word-to-mouth. "There are so many odd stories about how people ended up with us." Isabel says.

Monitoring and evaluation

The core team (Isabel and the interns) meet every Tuesday to evaluate how everything is going. Monitoring plays an essential role in this evaluation. TBYW always keeps track of how many people are attending the diners and how much they donate on average. By monitoring this, TBYW can see what works and whatnot. To illustrate this process, TBYW currently observes that the Monday diners are attracting fewer people than diners on Wednesday. Therefore TBYW is now looking at how they can increase this number of people.

Drivers and barriers

Drivers

As mentioned before, Isabel believes that educating people about food waste and food waste prevention is essential for raising awareness. She does not believe that saving food in terms of quantity will have a systemic impact on itself. However, saving food and showing people what they can do with food waste has more of an impact. In doing so, having enough volunteers, partnerships, a place to host activities, and maintaining good relations with everyone involved are crucial for success as a food waste initiative. "It sounds super cheesy, but the people from TBYW keep it running. I cannot do it all by myself. We need at least ten people to prepare the diner." Isabel says.

Barriers for TBYW

Major barriers

TBYW is currently not experiencing a lack of money. However, this will become a problem when TBYW cannot host their diners or when it wants to expand, for instance, buy a new cargo bike. Nonetheless, TBYW still experiences an economic barrier in the form of raising funds such as subsidies. The process of applying for subsidies at the municipality of Amsterdam has been unsuccessful for TBYW because of a lack of transparency on how to apply for subsidies. According to Isabel raising funds is a fulltime job. However, at TBYW, an intern is responsible for raising funds, making it difficult to establish a strong relationship with the municipality when it comes to subsidies. Nonetheless, Isabel does believe that having interns is a barrier. "Everyone is working really hard, and everything mostly runs successfully. However, you do need someone who is responsible for everyone." Isabel explains. Guiding the interns is thus crucial.

Minor barriers

When building relations, TBYW also experiences a cultural barrier. Not every partner keeps their leftover food aside for TBYW, which means that Isabel, who is picking up the food, needs to be there before the waste companies collect it. If Isabel is delayed for some reason, this food will turn too waste. Luckily, some partners do keep their leftover food aside. "Some of them do, because they are nice. And then some of them just do not care quite yet." Isabel says. Building a strong relationship is necessary to convince all partners to do the same.

An organizational barrier is that the current contract with Dokhuis limits the number of people that join the diners. Especially the activities on Mondays have significantly lower attendance than the diners on Wednesdays. Activities from Wednesday to Friday would be more suitable, definitely when it comes to attracting more people. However, this will not be possible at Dokhuis, and moving locations is not an option for Isabel. "Keeping this location is already a lot of work, let alone finding another one." Isabel explains.

Municipality of Amsterdam

The municipality of Amsterdam could make it easier to apply for subsidies. By making more visible which subsidies are available and who are eligible to apply, the municipality could help TBYW apply for the right subsidies. And thus, increasing its chances to apply for one successfully. Having a contact person within the municipality that could assist with applying for subsidies could also help. Another way in which the municipality could help food waste initiatives is to provide locations and sponsor cargo bikes. Lastly, Isabel thinks that the municipality should be more actively collecting biowaste. For instance, after the diners, TBYW always has some food scraps leftover. Currently, this is not collected separately, while it can still serve as compost.

Impact

Environmental impact

In their year-end report of 2019, TBYW made an estimate on how much food they collected during the year based on their activities. See table 4.7 for the environmental impact of TBYW over 2019.

Table 4.7: Environmental impact of TBYW. Source: author

Indicators	TBYW
Amount of collected food waste (in kg)	**10,775**
Amount of CO_2-eq. emissions avoided (in kg)	**26,937.5**

Socio-economic impact

With their wasteless diners, free supermarket and workshops TBYW has a significant socio-economic impact. In total, they stimulated 7,357 face-to-face interactions between individuals. Additionally, the diners also serve as a way to inspire and activate people to something with food waste themselves, including the 60 to 70 volunteers. TBYW also has a website on which it provides information about food waste and a blog with relevant news about sustainability as well as tips and tricks related to food waste. Such news articles include, for example, recent studies on the impact of food waste and five tips for sustainable shopping in Amsterdam. The workshops are also focused on activating people, along with building their capacity to be creative with food waste. When it comes to capacity building, all eight interns at TBYW also gain much experience simply by working every week and volunteering.

In terms of economic impact, TBYW currently provides one payed part-time job for 20 hours per week. Additionally, because their wasteless diners and free supermarket are all on a donation basis, they offer people the opportunity to pay the amount that is deemed affordable by them.

4.6 Case 6: Guerilla Kitchen

Guerilla Kitchen is a food waste prevention initiative that organizes a free supermarket filled with food waste. Every Wednesday the supermarket is open for everyone who needs it. People can take whatever they want and how much they want.

Organizing

Origin of the initiative

The idea behind Guerilla Kitchen started in 2013 when Elise was living in Australia with her friends Gerda and Andrew. Because Australia is a costly country, and Elise was didn't have a lot of money at the time, they started doing dumpster diving for leftovers food, despite it being illegal. While doing this she realized how much food ended up being wasted. In 2014 all three returned to the Netherlands and continued to do the same in the Netherlands. They started a free supermarket in the Spaarndammerbuurt for families living on a minimum wage budget. At some point, Elise's friends Gerda and were fined for dumpster diving. This is when they decided to do things differently by collecting food from food businesses. Andrew worked at the Food Center in Amsterdam and saw that much food was wasted there. From that moment on, they started

collecting leftovers from the Food Center. In contrast to the Voedselbank, Elise did not want to know who comes to the supermarket, how many people come, and how much food they take with them. Therefore Elise started the first anonymous free supermarket in Amsterdam. "You have to fill out so many forms and give them everything you have, just to show that you are eligible. I found this bureaucracy horrible", Elise says about the Voedselbank.

Organizational structure

Although Guerilla Kitchen has no official legal form the initiative sees itself as a food waste organization. After Gerda and Andrew stopped working at Guerilla Kitchen Elise became the primary coordinator. The organization consists of a core team of three to four people. In addition to the core team there are around 10 to 15 volunteers to help with activities such as picking up food. This is what Elise calls the inner circle. On Facebook, Guerilla Kitchen has an extra 900 potential volunteers. However, around 600 people are from other countries and have moved back. A regular week at Guerilla Kitchen starts on Wednesday. Typically there is a morning shift from 9 until 12 AM in which food is collected and brought to the supermarket. The morning shift is followed by an afternoon shift from 12 until 15 PM. During this shift volunteers make sure that the supermarket is running smoothly after which they clean up.

There is an online schedule in which volunteers can register for a particular shift. Along with the core team, Elise makes sure that there are always enough volunteers for both shifts. The core team usually makes all decisions, although Elise has the final say when it comes to important matters. According to Elise, this the decision-making process is very organic and informal. Everyone

is welcome to give input and make suggestions, while Elise makes sure it fits within the structure of Guerilla Kitchen. "The core team can make decisions themselves. They do not even have to call me. However, when none of the coordinators are present, then I will always get a call to see what to decide. So it's an organized chaos," Elise explains.

Core values

The biggest driver behind Guerilla kitchen is to save food from being wasted. "We are a neighborhood initiative, sometimes called a 'signaleringskeuken'. In other terms, a group that observes something and acts on it as an individual, but also as organization or community.", Elise says. Food waste is something Guerilla Kitchen has observed and decided to take action upon, instead of looking further up the chain. To achieve this, Guerilla Kitchen makes no distinction whatsoever when it comes to their users. Rich or poor, young or old, everyone is welcome as long as they help to tackle food waste. It also doesn't matter how much food a client takes from the supermarket. Guerilla Kitchen even has a policy deciding that volunteers are not allowed to show any judgment towards clients that take a lot of food. "It's hard to know where they come from. Maybe they also bring food for their sick mother or their neighbor." In short, Guerilla Kitchen allows everyone, rich or poor, to join their "peaceful fight" against food waste.

Doing

Activities

As said, Guerilla Kitchen started its free supermarket in 2014 in the Spaarndammerbuurt. This was a great success and forced

Guerilla Kitchen to look for a bigger space. Eventually, a year later, in 2015, Guerilla Kitchen made a deal with the Robin Food Kollektief who are located in the Nieuwe Anita in Amsterdam Oud-West. After moving, Guerilla Kitchen started to organize free diners made from food waste together with The Robin Food Kollektief. Every week 60 to 80 people joined the diners, while the Nieuwe Anita only had room for around 40 people. Therefore the dinner had to be split up into two shifts. Sadly, Guerilla Kitchen became the victim of its own success. The diners became so popular that it was impossible to keep the kitchen clean and keep the noise level down. It was also hard to find enough coordinators to make sure the diners would run smoothly. During this time, the free supermarket received less attention. It became more of a side project, while the diners became the main activity.

However, since Guerilla Kitchen stopped organizing diners, the free supermarket became its main activity again. Currently, Guerilla Kitchen organizes a free supermarket every Wednesday. Usually, the supermarket is open from 12 AM until 1 PM. In the morning, Guerilla Kitchen goes to the Food Center to collect leftover food from its partners. The food is collected using several cargo bikes, depending on the number of volunteers that available for the morning shift. After the food is collected at the Food Center, the supermarket is quickly set-up to be open for business. Just like before, the free supermarket became a great success again. It started with a first-come, first-served principle. However, because of the number of people that showed up, there was not enough food for everyone. Therefore Guerilla Kitchen recently introduced a raffle system with which a limited number of people can get a ticket. It also decides in what order people can visit the supermarket.

Elise says that the past year Guerilla Kitchen has grown significantly. "More people came, so we started collecting more food. We also scaled up our cargo bikes from one to four. This growth is significant, but it is also our maximum capacity at the moment", Elise says.

Partners, clients and users

Guerilla Kitchen has six permanent partners for the collection of food. Five of these partners are located at the Food Center in Amsterdam. When it turns out that not all cargo bikes are full after visiting these partners, Elise approaches other food businesses at the Food Center. With their permanent partners, Guerilla Kitchen has a good relationship. "This relationship has improved because our partners know they can count on us", Elise finds. However, this relationship is somewhat one-sided. "To our supplier, we always have to say 'yes, amen'. We always have to double-check what is reserved for us to pick-up and what not. Furthermore, the first rule I give volunteers that help us collect the food is that they should never point at food and ask if they can take more". Elise explains that it is important to be humble and thankful for their partners. Besides these partners, Guerilla Kitchen also works together with the Regenbooggroep. In exchange for free food, the Regenbooggroep does the maintenance of the cargo bikes.

According to Elise, their users are very diverse. "From fashion nova, to an old lady and families. I love it," she says. With the new raffle system, Guerilla Kitchen gives out 60 tickets per week. However, Elise thinks that these people also collect food for their partner, family, or neighbor. With this in mind, she expects that they reach about 100 people per week. Table 4.8 illustrates the partners and users of Guerilla Kitchen.

Table 4.8: Partners of Guerilla Kitchen. Source: author

Activities	Partners
For collecting food	Food Center: Crisp, FRESH Food, Rustenburg en zn, Loogman and a mushroom farmer. Bread: Bbrood
For the bikes	De regenbooggroep
For activities	Robin Food Kollektief

Framing

Vision for Guerilla Kitchen

In the short-term, Elise hopes to maintain the current activities for at least half a year. After that, she wants to evaluate everything and expand to an extra day for the free supermarket. This would probably be on a Friday or Saturday. However, an extra day also means more volunteers, it takes up more of people's time and making more arrangements. In the long-term, Elise hopes that Guerilla Kitchen does not exist anymore because there is no food waste to collect.

This long-term vision used to be different. Together with other initiatives such as De Kaskantine, Guerilla Kitchen worked out a plan for a daily free supermarket in an old monumental building at the Food Center. Because the old building needed about 400 million euros for renovation, it was sold for a symbolic amount of 1 euro to BOEi, a foundation that restores industrial heritage. The idea of Guerilla Kitchen and its partners was to use a part of the available 5000m2 for a supermarket. All the leftover food from food businesses located at the Food Center would be brought to one central place where it would be picked, prepared,

and packaged for sale. "This was a fantastic plan and really set something in motion for me. It would have been amazing if we could have worked out the concept of a full-time supermarket filled with leftover food for the people that need it the most." For a long time, this was the ultimate goal of Guerilla Kitchen. Unfortunately, BOEi dropped out. "We had a good plan, but suddenly they disappeared from the radar, and there was nothing we could do," Elise explains. Together with their partners, Guerilla Kitchen had a meeting with the aldermen, and although he supported the idea, there was nothing he could do.

Vision on food waste in general

According to Elise, the government now has to step up. She does not think that commercial businesses are the answer for tackling food waste. "Businesses are merely symptoms of what society wants. If there is money to be made, then there will also be spillovers," Elise explains. Elise notices that food waste is a hot topic at the moment. According to her, this is illustrated by initiatives like De Tweede Jeugd, Instock, and TGTG who are earning money from it. Now the government has to step up to reduce food production. Furthermore, Elise does not see food waste as a social problem, but as an environmental problem. She believes that calling it a social problem puts the blame on the individual, which is, in her opinion, not fair. "It is a difficult problem. For poor people it is impossible to understand. They just eat whatever they can buy," according to Elise. Elise is very positive about other food waste initiatives. Although she believes that initiatives like De Tweede Jeugd and TGTG are not very social, she doesn't see it as a problem. In the case of TGTG, "users end up in places where they would otherwise never go which makes it very accessible for multiple layers in society", Elise says.

Knowing

Knowledge and networks

Guerilla Kitchen was founded on Elise's past experiences, albeit not on experiences from the food industry. Elise does everything based on what she observes. "I do not have any background knowledge on topics such as food distribution systems", Elise says. Therefore she sometimes makes a mistake, but she accepts this. When it comes to sharing knowledge, Guerilla Kitchen only uses Facebook to communicate with is users. It is often used for announcements about upcoming supermarkets including opening time, location, and ground rules.

Monitoring and evaluation

There was a short period in which Guerilla Kitchen measured how much food they collected, although it was mostly to inform Facebook followers. Currently, Guerilla Kitchen does not keep track of the amount of food collected due to time constraints. Once the food is collected at the Food Center, there is only a limited amount of time to set up the supermarket. According to Elise, it takes too much time to have someone weight the amount of food that's being collected. Nonetheless, Elise acknowledges that this is something which is still missing in their organization. When it comes to evaluating their activities, Guerilla Kitchen doesn't really have a structured approach either. There are no weekly or monthly meetings, meaning that everything is very informal and their activities are always under evaluation. However, when someone wants to express their concerns they can just contact Elise or other coordinators within the core team.

Drivers and barriers

Drivers

Elise believes that the necessary conditions for food waste initiatives such as Guerilla Kitchen are a place to organize activities where the rules are more relaxed. According to Elise, an essential conditions is giving initiatives freedom to experiment with food waste.

Barriers for Guerilla Kitchen

Major barriers

The most significant barrier Guerilla Kitchen faces is cultural. In Elise's experience, the food market is still very conservative. When collecting food, Elise often experiences a feeling that she is not taken seriously. She remembers having many discussions with food businesses at the Food Center about the leftover food she could pick-up. She often wondered why she couldn't just collect the food since they were throwing it away anyway. "The real frustration is that you have to ask yourself if you're talking to a robot. Why does he not want to listen to me? People do not take you seriously. This is where the biggest frustration lies", Elise says.

Minor barriers

Guerilla Kitchen faces some minor organizational barriers, such as a lack of volunteers. This does not only affect the amount of food they can collect, but it also makes it challenging to make sure the supermarket runs smoothly. Another organizational barrier is that Guerilla Kitchen had some problems in the past

with residents of the building where the supermarket was hosted. Before the raffle system was introduced, there were too many people waiting in front of the entrance outside. As a result, residents felt that the supermarket caused too much trouble. Elise hopes that the raffle system will solve this issue.

Barriers to tackling food waste in general

Major barriers

Elise notices that policymakers and businesses do not understand what initiatives like Guerilla Kitchen aim to do. According to Elise it has become more difficult for social initiatives to survive in Amsterdam. "You notice this because of the many initiatives around us that fail Everything becomes less human, less cultural, and more businesslike. The same goes for the whole city of Amsterdam." According to Elise, Amsterdam makes it very hard for initiatives to start and maintain themselves.

Municipality of Amsterdam

Elise does not believe that the municipality of Amsterdam can do something against overproduction of food as she regards it an issue of the national government. Nonetheless, Elise thinks that de municipality has an important role in facilitating local initiatives such as Guerilla Kitchen to start and grow. In order to do so, the municipality has to take a more active role than it has now. Another way to support food waste initiatives would be for the municipality to become a customer.

Impact

Environmental impact

Guerilla Kitchen collects food once a week on Wednesday. According to Elise, they collect approximately 350 kg of food waste per week. See table 4.9 for the environmental impact of Guerilla Kitchen over 2019.

Table 4.9: Environmental impact of Guerilla Kitchen. Source: author

Indicators	Guerilla Kitchen
Amount of collected food waste (in kg)	18,200
Amount of CO_2-eq. emissions avoided (in kg)	45,500

Socio-economic impact

Every week at least 60 people (excluding volunteers) make use of the free supermarket organized by Guerilla Kitchen. This comes down to approximately 3,120 people a year. Since it is a supermarket it is assumed that there is a limited amount of social interaction between these people. The quality of interaction between the six to eight volunteers at the weekly supermarket is much higher. Elise stays that the volunteers are always having fun, making conversation and listening to music when they're organizing the supermarket. It is not without reason why Elise calls this group of volunteers the inner circle. With their free supermarket Guerilla Kitchen hopes to make people more aware of food waste. Furthermore, Guerilla Kitchen is actively trying to persuade people to join them as a volunteer in their 'peaceful fight against food waste'. However, apart from the from the free

supermarket, Guerilla Kitchen is not using any other channels to activate and educate people. Their Facebook page is only used to announce the next free supermarket and break down the ground rules.

Considering the economic impact, Guerilla Kitchen runs completely on volunteers and donations. With their free supermarket they make food affordable for all groups in society, poor or rich. They do not decide who is eligible to get a ticket for the supermarket and who is not. Furthermore, they also do not set a limit on the amount of food someone can bring home.

5

Chapter 5: Cross-case comparison

This chapter compares all food waste prevention initiatives. The four ways of organizing, framing, doing and knowing will be used as guidance for this comparison. Furthermore, the drivers and barriers the different initiatives experienced are also compared.

5.1 Comparison practices of food waste prevention initiatives

Comparison organizing

Table 5.1 gives an overview of the key differences between food waste prevention initiatives when it comes to 'organizing'.

The first thing that stands out is the variety of legal forms among the initiatives. Especially between TGTG and Guerilla Kitchen, there is a big contrast. They are on opposite sides of the spectrum with in-between the other initiatives. There are also significant differences considering the number of employees and/or interns. Whereas TGTG employs more than 30 people,

the other initiatives do not come close with mostly having zero, one or two employees. Contrastingly, when it comes to interns and volunteers, TBYW, De Kaskantine, and Guerilla Kitchen stand out. However, for De Kaskantine and Guerilla Kitchen, the pool of volunteers is significantly less, and both do not use interns. Furthermore, it is notable that the other initiatives, including TGTG, have no volunteers at all.

Regarding the decision-making processes, the differences are smaller. The majority of the initiatives have a formal process, while only De Kaskantine and Guerilla Kitchen have an informal process. Both initiatives have no strict hierarchy and no weekly meetings. When it comes to making decisions, TGTG and TBYW are very structured since both initiatives have a clear organizational structure. TBYW has weekly meetings, a division of responsibilities between the coordinator and interns, and a board that needs to be consulted for any major decisions. TGTG also has a clear division of responsibilities within the different teams and weekly meetings between the managers of these teams. When it comes to any major decisions, the managers will discuss what to do, but eventually, the country manager has the final say. What makes TGTG stand out, even more, is that it has branches in 15 countries. This is in sharp contrast with all other, more locally oriented initiatives.

Lastly, all initiatives show similar core values, which are all related to food waste prevention. Nonetheless, every initiative has a different idea to do so. TGTG is by far the most ambitious initiative, aiming to reduce food waste on a global scale. On the other hand, De Tweede Jeugd only focuses on reducing the amount of bread waste within the Netherlands. Furthermore, De Kaskantine is all about stimulating more self-sufficiency, something that goes beyond food waste, while TBYW believes

that raising awareness of food waste is the most important thing to do.

In sum, food waste prevention initiatives show a lot of similarities and differences in how they are organized. Furthermore, although every initiative focusses on food waste, they all have different focus areas within this topic. These different focus areas show how diverse these initiatives are and that there are many different ways to approach this.

Table 5.1: Overview key characteristic food waste prevention initiatives in terms of organizing. Source: author

Organizing	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Legal form	Sole proprietorship	Limited liability company (LLC)	Cooperative	One-man business	Foundation	No legal form
Number of employees/ interns	2	35	None	1 intern	1 employee and 8 interns	None
Number of volunteers	None	None	20	None	60 to 70	15
Decision-making process	As a sole proprietorship all decisions are made by one person.	Very formal decision-making, with a management team and regular meetings.	Informal, no weekly meetings.	Formal decision-making with weekly meetings.	Very formal decision-making with weekly meetings.	Very informal decision making, no weekly meetings.
Core values	Prevent as much bread waste as they can.	Tackling food waste globally	Being self-sufficient with minimum expenses	Prevent as much food waste as they can.	Raising awareness about food waste.	Prevent food waste and activate people to join their 'peaceful fight' against food waste.

Comparison doing

Table 5.2 gives an overview of the key differences between food waste prevention initiatives when it comes to 'doing'.

The most notable difference between food waste prevention initiatives is its business model. Whereas De Tweede Jeugd and TGTG are commercially minded, the other initiatives offer almost all their activities on a donation basis. This difference has to do with the strict rules around food safety. When these initiatives start asking money for their products made from food waste, they need to adhere to strict rules and sometimes even need a license to do so. Since it is impossible to guarantee a certain quality with food waste, some initiatives sell everything on a donation basis. However, initiatives like Guerilla Kitchen, TBYW, and De Kaskantine also care about their social impact. Therefore asking for money is out of the question. This belief contrasts with TGTG and De Tweede Jeugd, which both are commercial entities. What makes TGTG stand out is that it is focused on preventing food waste, but does not have much to do with regulations around food safety. TGTG merely offers a platform for food businesses to sell their leftover food. In this context, one could say that TGTG qualifies more as a tech company. Regarding De Tweede Jeugd, it only uses unsold bread, which is immediately frozen to keep it fresh. However, the other products used for making the grilled sandwiches are fresh.

In contrast to the more commercially minded initiatives, the non-commercial initiatives are mainly concerned with collecting, preparing, and gifting. However, TBYW and De Kaskantine do much more than just selling products or hosting a free supermarket. These initiatives also offer workshops on topics related to food waste to educate and activate people into taking

action themselves. In addition to workshops, De Kaskantine also provides do-it-yourself kits for people to do at home. Furthermore, these initiatives successfully host free weekly diners made from food waste, often along with music performed by local artists. However, what makes De Kaskantine stand out is that its activities go beyond reducing food waste. It also focuses on cultivating food, generating energy, and collect, and filtering and storing water. These activities are all part of its goal to show that it is possible to be completely off-grid, even within a city like Amsterdam.

When it comes to the number of partners, the initiatives show strong similarities. Especially when looking more closely, it is possible to conclude that there is much overlap between the initiatives concerning their partners. Only TGTG stands out with 420 partners, whereas De Kaskantine, Guerilla Kitchen and Healthy & Affordable all use the same partners, which are located at the Food Center in Amsterdam. De Tweede Jeugd and TBYW have significant different partners. De Tweede Jeugd has partners that produce fresh and delicate food products, while TBYW predominantly partners up with small grocers instead of big food retailers at the Food Center Amsterdam.

The differences between commercial initiatives and non-commercial also become evident concerning the number of clients and sales. Apart from Healthy & Affordable, the other non-commercial initiatives do not engage in selling. When it comes to sales and users, TGTG once again stands out. However, with their activities, non-commercial initiatives attract customers. In doing so, De Kaskantine shows a considerably higher number of visitors than Guerilla Kitchen and TBYW.

Table 5.2: Overview key characteristic food waste prevention initiatives in terms of doing. Source: author.

Doing	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Business models	Commercial	Commercial	Non-commercial	Non-commercial	Non-commercial	Non-commercial
Main activities	Packaging and selling (for profit)	Selling (for profit)	Collecting, cooking, gifting and teaching	Collecting, preparing, packaging, distributing and gifting	Collecting, preparing, cooking, gifting and teaching	Collecting, preparing and gifting
Main products	Grilled sandwiches and Crostini's from bread waste	A platform for food businesses to sell their leftover food.	Free supermarkets, diners and brunches made from food waste, and workshops.	Flavored powders from food waste and packages of dried fruits, nuts and chocolates	Wasteless diners' and supermarkets made from food waste, and workshops	Free supermarket filled with food waste.
Number of partners	6	420	8	10	8	8
Number of clients/ users	31 clients	1.5 million app users (nationwide)	1000 users per week	Unknown	125 users per week	60 users per week
Number of sales	48,000 to 60,000 grilled sandwiches p/y	145,000 Magic boxes per year	None	Unknown	None	None

Comparison framing

Table 5.3 gives an overview of the key differences between food waste prevention initiatives when it comes to 'framing'.

In terms of framing, table 5.3 shows that all initiatives have different visions on how to prevent food waste. Logically, commercial initiatives are primarily focused on increasing sales, while non-commercial initiatives want to expand on the number of activities. Especially Guerilla Kitchen stands out, by saying that it hopes not to exist in the long-term because there would be no food waste to collect anymore. This vision is in sharp contrast with the commercial initiatives which are focused on perpetuating themselves. De Tweede Jeugd, for instance, wants to switch to a different production system that will decrease the impact of De Tweede Jeugd in terms of saving bread. Nevertheless, this will help sustain De Tweede Jeugd as a food waste prevention initiative, which is also the livelihood of its owner. The same rhetoric could apply to TGTG, where less food waste will eventually mean people are losing their job.

Concerning the ideas on how to prevent food waste nationwide, De Kaskantine and TBYW predominantly focus on raising awareness through workshops, which corresponds with their critique on other initiatives. Both initiatives believe that raising awareness of food waste is crucial in preventing food waste and believe that only collecting food will not change people's behavior. Therefore, they see saving food merely as a way to increase this awareness. Consequently, both initiatives do not care about their environmental impact but primarily focus on their social impact.

The opinions on what is necessary to prevent food waste nationwide also differ sharply. De Tweede Jeugd believes that businesses have to take action, while Guerilla Kitchen believes that the government has to step up since businesses are a representation of policies implemented by that same government.

Nevertheless, the initiatives also show strong similarities in the way they frame food waste. All initiatives agree that food waste is a severe problem in society and that the government, municipality, businesses, and households are not doing enough to tackle this problem. Moreover, despite their actions and hard work, all initiatives feel that they are merely scratching the surface when it comes to reducing food waste. Therefore the initiatives do not believe they have any transformative power to change policies.

Table 5.3: Overview key characteristic food waste prevention initiatives in terms of framing. Source: author

Framing	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Short-term vision	Finding a new partner and removing Bread & Butter from the catalog.	Increase sales of Magic boxes and start raising more awareness by offering workshops and lesson packages.	Raising more awareness by giving workshops in community centers.	Sell more food, dehydrate more food and save more food.	Expand the amount of 'wasteless diners' and increase 'feeding the movement' activities.	Expand to an extra day for the free supermarket.
Long-term vision	Transition from using old bread for the grilled sandwiches to baking fresh new bread from bread waste.	Increase the amount of social interaction and the opportunity to volunteer.	Create an alternative economy wherein people are more self-sufficient.	Professionalize the organization and transform into its own company.	Increase the amount of workshops, also for companies.	To not exist anymore.
Vision on food waste	Big businesses have to take more responsibilities when it comes to prevent food waste	Food waste initiatives have to work together in order to make an impact	Raising awareness on food waste is the only way to prevent food waste.	Believes that raising awareness on food waste is important. But changing the system requires above all new legislation	Believes that supermarkets play a crucial role in preventing food waste. Raising awareness is therefore imperative	Feels that the government has to step up and take action to lower the food production.
Vision on other initiatives	Very positive about TGTG	Admires the initiatives that are focused on social impact	Believes that online initiatives such as TGTG will not achieve systemic change, but merely serve as an extension of the food supply chain.	Is skeptical towards commercially minded initiatives, because they are focused on perpetuating themselves.	Believes that people are not smart enough to take lessons from collecting free food. Hence activities should do more than just saving food.	Very positive about other initiatives. It should not matter whether they are commercial or not. As long as they prevent food waste.
Transformative impact?	No	No	No	No	No	No

Comparison knowing

Table 5.4 gives an overview of the key differences between food waste prevention initiatives when it comes to 'knowing'.

Notable similarities are that most initiatives were founded upon experience somewhat related to food waste. Furthermore, the initiatives use similar channels to spread their knowledge. However, in addition to sharing information online, De Kaskantine and TBYW also use word-to-mouth through their workshops and diners. Also, TGTG stands out because of its professional basis provided by its headquarters in Denmark.

With regards to networks and monitoring, only half of the initiatives are part of an official network or monitors their impact. Concerning networks, this indicates that not much expertise and knowledge is shared among food waste prevention initiatives. Notable is that the initiatives are all part of different networks. Nonetheless, the initiatives are active within the same informal networks. To illustrate, De Kaskantine and Guerilla Kitchen worked together in the past, while Coby from Healthy & Affordable is also on the board of TBYW. Concerning monitoring, TBYW stands out, since it is the only non-commercial initiative that keeps track of how many people it attracts with the diners and how much money it raises. TGTG is the only initiative that measures its environmental impact. However, it only does this nationwide and not specifically for Amsterdam. Although the other initiatives emphasize the importance of monitoring, they are currently not doing this because of a lack of time and resources.

Lastly, the way the initiatives evaluate their activities strongly correlates with how their decision-making process is organized

(see table 5.1), which results in significant discrepancies. Initiatives that have weekly meetings show more formal evaluation processes than initiatives that do not engage in weekly meetings. Especially Guerilla Kitchen and TGTG are in sharp contrast with each other. Whereas Guerilla Kitchen has no systems in place for evaluation, TGTG has a communications department focusing on user complaints. Nevertheless, this does not mean that the initiatives with an informal evaluation system do not evaluate their activities. Guerilla Kitchen, for instance, introduced a raffle system after it received complaints from their neighbors.

Table 5.4: Overview key characteristic food waste prevention initiatives in terms of knowing. Source: author

Knowing	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Producing knowledge	Founded upon previous experience working as a chef	Founded upon the professional basis provided by the TGTG HQ in Denmark.	Founded upon previous experience working in agriculture	Founded upon previous experience working in the food industry and management.	Was founded without any experience.	Initiative was founded upon previous experience doing similar activities.
Sharing knowledge	Uses their website and social media to share information about their products, were they are available, and information on how much bread they save.	Uses their website social media and news letter to share information on how to prevent food waste, their activities, and how much food they currently save.	Uses social media, their website and workshops to share knowledge on food waste prevention and their activities.	Uses social media channels and their website to share information about their activities.	Uses social media, their website, word-to-mouth, and workshops to share knowledge on food waste prevention and information about their activities.	Uses Facebook to communicate information about their activities.
Networks	Verspilling is verrukkelijk' and 'Social Enterprise Network'	Samen tegen voedselverspilling	No networks	Food circle	No networks	No networks
Monitoring	Yes	Yes	No monitoring	No monitoring	Yes	No
Evaluation	Informal	Formal	Informal	Formal	Formal	Informal

5.2 Impact comparison

This section compares the environmental and socio-economic impact of the food waste prevention initiatives.

Comparison environmental impact

Table 5.5 gives an overview of the environmental impact of food waste prevention initiatives. Altogether, the initiatives saved approximately 214,000 kg of food, which equals 0.02% of the total commercial food waste in Amsterdam. Compared to the total amount of annual food waste in Amsterdam, the initiatives contribute significantly less to approximately 0.003%. This shows that the environmental impact of these food waste prevention initiatives is limited, which is in line with their expectations. Figures 5.1 and 5.2 illustrate the difference between the initiatives in terms of food collection and corresponding CO_2-eq. emissions. Notably, TGTG is responsible for 66% of the total amount of prevented food waste all food waste prevention initiatives. Therefore it has the most significant environmental impact, mainly due to its high number of users and partners. Surprisingly, TBYW scores significantly lower than De Kaskantine despite having similar activities. Moreover, Guerilla Kitchen, which only organizes a free supermarket, collects more food than TBYW. Furthermore, it is worth to mention that De Tweede Jeugd collects more food than Healthy & Affordable, but has a significantly lower impact when it comes to CO_2-eq. emissions. This lower impact results from the fact that De Tweede Jeugd only collects bread, which has a significantly lower CO_2-eq. footprint than the average footprint of food waste.

Table 5.5: Overview of the environmental impact of food waste prevention initiatives. Source: author.

Environmental impact	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen	Total
Total amount of collected food waste in 2019 (in kg)	7,800*	145,000	28,600	3,600	10,775	18,200	**213,975**
Amount of CO2-eq emissions prevented in 2019 (in kg)	7,410	368,300	71,500	9,000	26,937.5	45,500	**528,647.5**
Share of total amount of commercial food waste in Amsterdam (in %)	0.0008**	0.01**	0.003**	0.0004**	0.001**	0.002**	**0.02****
Share of total amount of food waste in Amsterdam (in %)	0.0001***	0.002***	0.0004***	0.00005***	0.0001***	0.0002***	**0.003*****

**only bread waste, **share of a total of 9715 tonnes of commercial food waste in Amsterdam, ***share of a total of 74808 tonnes of all food waste in Amsterdam.*

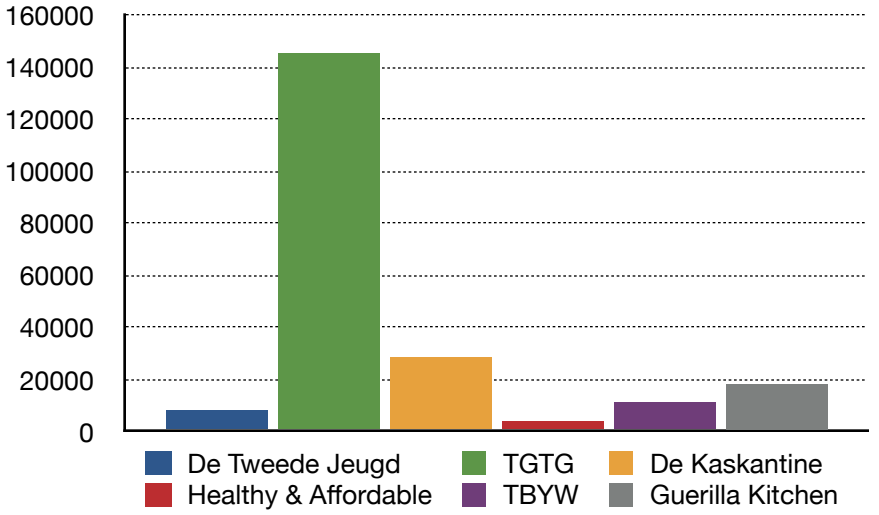

Figure 5.1: Overview of the total amount of collected food waste in 2019 (in kg). Source: author.

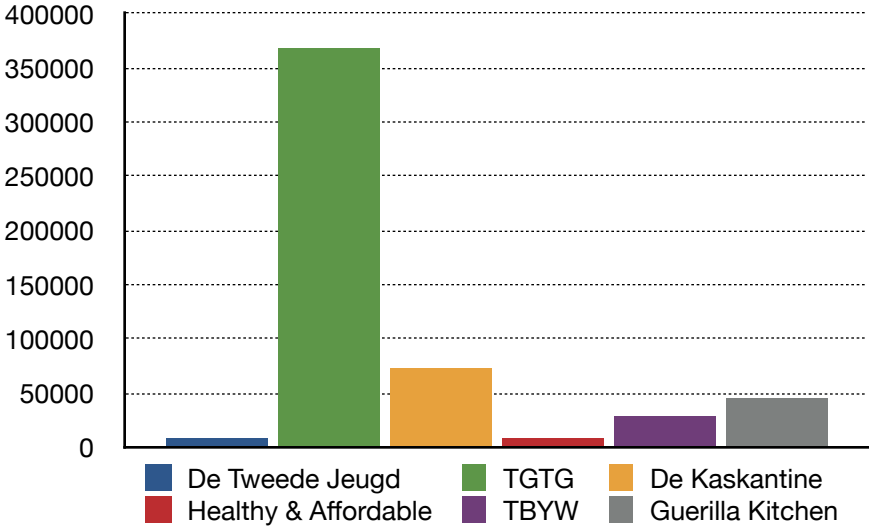

Figure 5.2: Overview of the amount of CO_2-eq. emissions prevented in 2019 (in kg). Source: author.

Comparison socio-economic impact

This research used social interaction, awareness, employees/ volunteers, and type of economic activities as indicators to assess the socio-economic impact. Table 5.6 gives an overview of the key differences and similarities when it comes to their socio-economic impact.

Table 5.6 shows significant differences and similarities between the initiatives in every indicator. With regard to social interaction, De Kaskantine and TBYW put in the most effort to stimulate this. With their diners and workshops, they have stimulated thousands of face-to-face interactions. This interaction level is different from the type of interaction TGTG and Guerilla Kitchen stimulate, namely interaction between the buyer and cashier. Since TBYW and De Kaskantine provide a level of interaction that is of high quality, these initiatives have the most prominent social impact in terms of social interaction.

Concerning awareness, all initiatives share, to some extent, information about food waste and food waste prevention. However, how much information and how they share this information strongly fluctuates. The initiatives can be categorized into two sides. On the one hand, De Tweede Jeugd, Healthy & Affordable, and TGTG primarily use their website and social media channels to share knowledge on food waste. Only TGTG, which has more than 300,000 subscribers on its newsletter and social media pages, has a weblog that gives additional information on how to prevent food waste. On the other hand, De Kaskantine, TBYW, and Guerilla Kitchen raise additional awareness of food waste and food waste prevention through workshops, dinners, free supermarkets, and do-it-yourself kits. Especially, TBYW and De Kaskantine take it a step

further through organizing workshops and do-it-yourself kits. These activities not only activate people into taking action themselves, but also build their capacity to prevent food waste. Additionally, Guerilla Kitchen, TBYW, and De Kaskantine also activate people into taking action themselves. Apart from showing people the possible ways to prevent food waste, these activities also allow the initiatives to activate people to join them as volunteers.

In section 5.1, the number of employees, interns, and volunteers was already compared (see table 5.2). With regard to the economic impact, TGTG stands out by providing 35 full-time jobs. In doing so, it significantly contributes to Amsterdam's local economy. The other initiatives do not come close to the number of employees TGTG has. Moreover, most initiatives only use interns and volunteers.

Lastly, the type of economic activities shows that, apart from De Tweede Jeugd, all initiatives increase the affordability of food. De Kaskantine, Healthy & Affordable, TBYW, and Guerilla Kitchen provide free food for anyone that needs it. For people that still want to pay for their food, it is possible to donate money. These initiatives thus allow people to pay what they can afford. TGTG has a different approach and offers food with a 66% discount. This discount increases the affordability of food and also allows businesses to still earn some money from the food they would otherwise need to throw away. In contrast to the other initiatives, De Tweede Jeugd does not influence the affordability of their products, because it allows their clients to ask the price they deem fair.

Table 5.6: Overview socio-economic impact. Source: author.

Socio-economic impact	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Social interaction	No activities	Stimulates people low quality interaction	Spurs high quality social interaction	No activities	Spurs high quality social interaction	Stimulates people low quality interaction
Awareness	Provides information on food waste on website	Provides information on food waste and food waste prevention on website, weblog, social media and news letter.	Provides information on self-sufficiency, food waste, food waste prevention through their website, workshops, do-it-yourself kits and diners.	Provides information on food waste on website	Provides information on food waste and food waste prevention through their website, social media channels, weblog workshops and diners.	Provides information on food waste through their social media channels and supermarket.
Employees	2	35	Only volunteers	1 intern	1 employee and 8 interns	Only volunteers
Type of economic activities	Has no influence on the asking price of their grilled sandwiches.	With their Magic Boxes, TGTG makes it possible to buy food with a 66% discount.	It makes food more affordable because it is on a donation basis.	Products are sold on a donation basis, so people can set a price that they deem to be affordable.	Offers free diners and a free supermarket wherein people can decide whether they want to donate money or not.	Guerilla Kitchen offers free food for all groups in society. It does not matter if people are rich or poor.

5.3 Drivers and barriers comparison

Comparison drivers

Regarding the main drivers for preventing food waste in general, it is possible to conclude that most initiatives agree with each other (see table 5.7). Four out of the six initiatives believe that awareness is an essential driver. However, the way the initiatives believe how one should raise awareness of food waste still varies. On the one hand, TGTG believes that the key to raising awareness is to clearly communicate knowledge on food waste prevention. On the other hand, De Kaskantine and TBYW believe that raising awareness is to educate people on food waste prevention. De Kaskantine believes that community-centers could play a vital role in raising awareness. Notably, Healthy and Affordable believes that in addition to raising awareness, implementing new legislation and sustaining motivation is vital. Notably, all initiatives do not seem to think that changing legislation is a crucial driver. This could be partly explained by the fact that most initiatives do not believe it will be possible to change existing legislation.

Another notable difference is that only De Tweede Jeugd believes that subsidies are vital for food waste prevention initiatives. In contrast to De Tweede Jeugd, Healthy & Affordable does not believe in subsidies to prevent food waste. It perceives motivation as the most critical driver since there are many hurdles that food waste prevention initiatives have to take. Furthermore, TBYW and Guerilla Kitchen argue that having a place to organize their activities is also crucial. This argument is in contrast with TGTG, which does not need a location to host its activities, but needs a good (technologic) infrastructure to have an impact. Lastly, it is also remarkable that TBYW is the only

initiative that mentions that having enough volunteers is a crucial driver for initiatives. Especially since four out of six initiatives run on volunteers.

Table 5.7: Overview drivers food waste prevention initiatives. Source: author.

Indicators	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Main drivers for food waste prevention initiatives	Money: subsidies could help De Tweede Jeugd grow	Having a great infrastructure in place		Staying motivated	Having enough volunteers, partnerships, a place to host activities and nurturing good relations between everyone involved.	A place to organize activities and more relaxed rules.
Main drivers for food waste prevention in general		Knowledge on food waste and food waste prevention	Raising awareness through community centers	New legislation, raising awareness and motivation to continue to address food waste.	Educate people to raise awareness on food waste prevention.	Giving initiatives the freedom to experiment with food waste.

Comparison barriers for food waste prevention initiatives

Tables 5.8 and 5.9 show the different barriers that food waste prevention initiatives do experience in their battle against food waste. It shows many discrepancies in what initiatives consider as major and minor barriers.

An often experienced economic barrier is a lack of money, mainly due to having difficulties with applying for subsidies. Especially for De Tweede Jeugd and TBYW, this is a significant barrier when it comes to increasing their impact. De Kaskantine experiences an entirely different economic barrier since it is currently unable to pay the estimated rent for their location. The reason behind this barrier is that the municipality currently calculates the rent price so that it does not take into account that De Kaskantine is an off-grid initiative with a mixed land-use. As explained in section 4.3, the rent price is much higher and not in line with their activities.

This economic barrier also corresponds with a major political barrier that De Kaskantine experiences: there is no policy in place for off-grid initiatives like De Kaskantine. This lack of policy has much to do with conservative politicians that refuse to take any measures against food waste. TGTG adds that it feels there is a lack of urgency among politicians for taking action to prevent food waste. Moreover, De Tweede Jeugd feels that the municipality does not recognize its organizational form as a commercial food waste prevention initiative. Without recognition, De Tweede Jeugd is ineligible to apply for subsidies. Like De Tweede Jeugd, De Kaskantine also experiences this barrier, but it does not see this as a major political barrier.

De Tweede Jeugd and Healthy & Affordable experience major organizational barriers, while TBYW and Guerilla experience minor organizational barriers. Especially De Tweede Jeugd stands out because its organizational barrier is not related to volunteers or a location, but is about the quality of their products. This corresponds with De Tweede Jeugd being a commercial initiative. Another notable difference is that Guerilla Kitchen is the only initiative that struggles with having enough volunteers. Remarkable is also that Healthy & Affordable experiences volunteers and interns that come and go as a major barrier because of experiences with volunteers in the past.

All initiatives experience similar cultural barriers when it comes to their activities to prevent food waste. However, only De Tweede Jeugd and Guerilla Kitchen experience this as a major cultural barrier. These initiatives also stand out in terms of what they experience as a cultural barrier. On the one hand, De Tweede Jeugd feels not recognized by the municipality for their work because it engages in commercial activities. On the other hand, Guerilla Kitchen feels not recognized by food businesses. The other initiatives agree with Guerilla Kitchen and see that many food businesses are still very conservative when it comes to taking measures to prevent food waste.

Lastly, there are surprisingly only two initiatives that experience minor legal barriers. This means that these barriers do not limit the core business of the initiatives. However, for TGTG, it limits expansion, while De Kaskantine always remains vulnerable when there is an inspection.

Table 5.8: Overview of the major barriers for food waste prevention initiatives. Source: author.

Barriers	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Major barriers						
Economic barriers	Unable to receive subsidies		De Kaskantine will not be able to pay the rent if there is no mixed land-use category.	A lack of income	A lack of money and difficulties with applying for subsidies.	
Political barriers	Organizational structure not recognized	Lack of urgency in the political field to prevent food waste	There is no policy in place for off-grid initiatives such as De Kaskantine and politicians are very conservative towards new plans to prevent food waste.			
Organizational barriers	Outsourcing of production is costly			Interns and volunteers come and go, which is a very time-consuming process.		
Cultural barriers	Feels not recognized for its work					Feels not taken seriously by food businesses.

Table 5.9: Overview of the minor barriers for food waste prevention initiatives. Source: author.

Barriers	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Minor barriers						
Political barriers			Because they sell drinks, they are not eligible for subsidies			
Organizational barriers					The current contract with Dokhuis limits the amount of activities	Falls short in number of volunteers and making sure the activities run smoothly.
Cultural barriers		Businesses are hesitant towards working with TGTG	Businesses are very conservative when it comes to food waste	Many businesses do not care about food waste	Some partners do not care about food waste and refuse to keep the food aside	
Legal barriers		Food safety rules limit TGTG to work with caterers and canteens	The off-grid water system is a potential problem for law enforcers			

Comparison barriers for food waste prevention in general

Table 5.10 shows the most significant barriers to tackle food waste nationwide according to food waste prevention initiatives. Notable is that all barriers are considered as major barriers, and there was no mention of minor barriers.

In terms of economic barriers, TGTG and De Kaskantine agree that the economic system currently enables food waste. According to De Kaskantine, this results from a system wherein the costs of food waste are not kept within the economic system. Therefore these costs are not included in the price of food. This argument corresponds with the idea of Healthy & Affordable, which argues that there is a value-disorder, which is caused by a low food price. According to Healthy & Affordable, this has caused a cultural barrier wherein people do not respect food anymore because it is too cheap. This value-disorder feeds another cultural barrier mentioned by TGTG, namely that there is a lack of awareness when it comes to food waste.

With regard to political barriers, De Tweede Jeugd, TGTG, and Guerilla Kitchen have a similar vision. They all feel that politicians do not give enough priority to the prevention of food waste. Moreover, the data suggest that this barrier corresponds with the other political barriers since not giving priority shows that politicians do not take food waste and food waste prevention initiatives seriously.

Healthy & Affordable stands out since it is the only initiative that mentions the importance of staying motivated. In the eyes of Healthy & Affordable, a significant organizational barrier is that initiatives quickly lose motivation, and therefore many initiatives

go bankrupt. Notably, no other initiative has mentioned this as a barrier.

Lastly, only two initiatives see the current regulations as a legal barrier. De Tweede Jeugd believes that the current regulations around working with food waste are too strict and limit initiatives to increase their impact. Additionally, Healthy & Affordable signals that supermarkets are also not aware of the rules around sharing food waste. This legal barrier derives from a lack of knowledge, which is also a frequently mentioned barrier. Half of the initiatives have mentioned barriers related to a lack of knowledge. Whereas TGTG and De Kaskantine mention similar barriers, TBYW is more specific, saying that it is unclear for what subsidies food waste initiatives can apply.

In sum, it becomes clear that the barriers experienced by food waste prevention initiatives are highly interrelated. Furthermore, the initiatives mostly have similar opinions on the barriers that limit food waste prevention in general.

Table 5.10: Overview barriers food waste prevention initiatives. Source: author.

Indicators	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
Major barriers						
Economic barriers		The current system enables wasting food too much.	The costs of food waste are not kept within the economic system.			
Political barriers	Lack of recognition for social enterprises	Food waste does not have a prominent place on the political agenda.				There is a misunderstanding between politicians and initiatives
Organizational barriers				Losing motivation to continue fighting against food waste		
Cultural barriers		Lack of awareness in society on food waste		There is a value-disorder because people do not respect food		
Legal barriers	Strict regulations and certificates around food waste			Supermarkets are not aware of the rules when it comes to gifting food.		
Lack of knowledge		There is a lack of knowledge among politicians, business and household on food waste and food waste prevention.	There is a lack of knowledge about the size and impact of food waste		It is not clear for which subsidies food waste prevention initiatives are eligible to apply	

5.4 Comparison expectations from the municipality of Amsterdam

Table 5.11 shows that food waste prevention initiatives can be divided into two sides. On the one hand, De Tweede Jeugd, TGTG, and TBYW believe that the municipality of Amsterdam can play an important role in preventing food waste. On the other hand, De Kaskantine, Healthy & Affordable, and Guerilla Kitchen are skeptical of the amount of influence the municipality can exert over food businesses and households to prevent food waste.

TGTG and TBYW both think the municipality should put more effort into waste separation, including biowaste. Furthermore, De Tweede Jeugd and TBYW agree that the municipality should provide subsidies for food waste prevention initiatives. Moreover, TBYW believes that the application process for subsidies needs to be more accessible and more transparent. Additionally, TBYW thinks that the municipality needs to actively support food waste prevention initiatives by providing locations and cargo bikes. Guerilla Kitchen agrees with TBYW, although they are skeptical about the capacity of the municipality to help.

Lastly, despite being skeptical towards the role of the municipality, De Kaskantine and Healthy & Affordable agree that the municipality could take measures against food waste. Examples of such measures are raising taxes on food waste and production. These measures will force businesses to be more careful about food waste.

Table 5.11: Overview of the expectations from the municipality of Amsterdam. Source: author.

Indicator	De Tweede Jeugd	Too Good To Go	De Kaskantine	Healthy & Affordable	Taste Before You Waste	Guerilla Kitchen
What do these initiatives expect from the city of Amsterdam?	Believes that the municipality should provide subsidies and become a client of food waste prevention initiatives	Believes that the municipality has to put more effort in waste separation in Amsterdam	Does not think the municipality has enough power to change anything. Potentially they could force business to produces less food waste.	Does not see a way for the municipality or government to change anything. Theoretically they could raise taxes on food.	Thinks that the municipality could make it easier to apply for subsidies, sponsor cargo bikes and provide locations for food waste initiatives to host their activities. Lastly, TBYW thinks that the municipality should put more effort in collecting biowaste.	Does not think the municipality can do something about food waste, but sees it as a responsibility for the government. Potentially, the municipality can help these initiatives start and grow by taking a more active role.

5.5 Transformative change

Transformative ambition

All the initiatives have a transformative ambition to prevent food waste. The initiatives want to achieve transformative change in various ways. De Tweede Jeugd wants to do this by giving old bread a new purpose and by introducing a new production process for bread. TGTG wants to increase its sales of Magic Boxes, and start with offering workshops and lesson packages to raise awareness of food waste prevention. De Kaskantine and TBYW already do this but want to expand on the number of workshops. Lastly, all initiatives want to increase the amount of food waste that they collect for their products, diners, and supermarkets. In addition to food waste prevention, De Kaskantine also hopes to change policies around off-grid initiatives such as itself. In sum, by raising awareness and collecting more food for their activities, the initiatives hope to inspire, educate, and activate more people and businesses to take measures to prevent food waste.

Transformative impact

Being asked whether initiatives thought they have a transformative impact, they all unanimously said no. Although all the initiatives implement new ways of organizing, doing, framing, and knowing, they only seem to affect those directly involved. The collection of food by food waste prevention initiatives gives food businesses the option to donate or sell their food waste. However, some initiatives argue that collecting this food is merely treating a symptom of the disease known as food waste. In doing so, one could argue that the collection of food

unintentionally gives food businesses an excuse to sustain their processes, such as faulty stock management or overproduction. In this case, overproduction and faulty stock management are diseases, while food waste is the symptom. The collection of food waste merely addresses the latter and thus helps to sustain existing, but faulty strategies of food businesses. However, food waste prevention initiatives also focus on the diseases of food waste by making food businesses and policymakers aware of their shortcomings, the adverse effects of food waste, and ways to prevent food waste. Unfortunately, this has not yet resulted in any change in regulations and policies focussed on food waste prevention. Nevertheless, food waste prevention initiatives did realize that instead of wasting food, food businesses now make sure to donate this food waste.

Transformative potential

Concerning the transformative potential, food waste prevention initiatives could have a significant impact as long as they work together. Sharing knowledge, volunteers, and food, and by jointly organizing activities, food waste prevention initiatives could significantly increase their impact. Altogether, the initiatives have the potential to redistribute thousands of kilograms of food waste to the people who want it. Furthermore, they could reach hundreds of thousands of people through workshops, lesson packages, dinners, and free supermarkets. Especially TGTG can play a crucial role in lobbying for new legislation and policies towards food waste prevention initiatives. Moreover, TGTG can give businesses insights into their stock management, something which is already resulting in businesses preventing food waste themselves. In doing so, it addresses not only food waste, but also faulty stock management and overproduction. Furthermore, De Kaskantine and TBYW can

increase awareness with their workshops, especially when sharing their knowledge with businesses and the use of community centers to spread this knowledge more locally.

5.6 Cross-case results summary

This thesis primarily aimed to give insights into the impact of food waste prevention initiatives in Amsterdam and whether this impact signifies the realization of transformative change. The study results indicate that all initiatives have a strong transformative ambition wherein they all aim to eradicate food waste. Furthermore, the data suggest that the initiatives do not have a transformative impact. Despite inspiring businesses and people to handle food more responsibly, the initiatives have not changed the current policy related to food waste. Moreover, the results show that policymakers (politicians and councilors) and food waste prevention initiatives are on opposing sides. This becomes especially visible in the story of De Kaskantine, wherein De Kaskantine struggles to find common ground with the municipality. These results correspond with the experiences of the initiatives. They all feel that the government, municipality, and businesses express a lack of urgency. Nonetheless, the study also shows that these initiatives certainly have transformative potential, especially when they join forces. The initiatives play an essential role in activating and educating people on food waste prevention, which has the potential to change people's perception of food waste. Eventually, this can lead to more pressure for policy changes.

Concerning the environmental impact, the results show that the initiatives have prevented an estimate of 0.02% of the total amount of commercial food waste in Amsterdam. With regard to Amsterdam's total amount of food waste, the initiatives prevented an estimate of 0.003%.

Concerning the socio-economic impact, the data suggest that non-commercial initiatives have a more significant impact

compared to commercial initiatives. This results from the fact that these initiatives do not focus on making a profit. All non-commercial initiatives mostly run on volunteers, and the activities are on a donation basis. On the other hand, the data suggest that commercial initiatives contribute to the local economy in terms of jobs, either directly or indirectly. The study also shows that most of the initiatives predominantly spread information on food waste through their social media channels and website. This information mostly contains information on why food waste is a problem. Lastly, although some initiatives have tips and tricks for food waste prevention on their media channels, only TBYW and De Kaskantine take it a step further with workshops to build capacity and activate people to start preventing food waste.

6

Chapter 6: Discussion

This thesis analyzed the impact of six food waste prevention initiatives in Amsterdam following the TSI theory. It analyzed the environmental and socio-economic impact of these initiatives, and to what extent these initiatives have realized transformative change. In other terms, to what extent have these initiatives transgressed from micro to meso-scales? In doing so, it looked into the different ways of organizing, doing, framing, and knowing and how this relates to the drivers and barriers these initiatives have experienced.

6.1 Limitations

This first section discusses the limitations of the research. In doing so, this section analyzes the validity of the results and discusses the circumstances that affected this validity.

Inherent to qualitative research, the interpretation of the gathered qualitative data is always open for biases towards a more desirable outcome. There are many types of biases, but the respondent bias and researcher bias are most relevant for this study. Considering the respondent bias, the results of this study depend highly on honesty in the respondents' answers. The

respondents may have given social-desirable answers or answers that fit the study's purposes, instead of giving their honest opinion. Since the interviews are focused on how 'their' initiatives perform, there is the risk that respondents exaggerated about their activities and impact. Considering the study relies on qualitative interviews as the primary data source, there is a lack of other research methods to ensure triangulation. A way to tackle this limitation was to use more sources such as respondents not directly involved with the studied initiatives. Interviewing these respondents would allow for a more just representation of their impact. However, this thesis tried to ensure triangulation by interviewing food waste experts but only managed to interview one expert. Unfortunately, this expert did not provide any useful information regarding the impact of food waste prevention initiatives. Therefore this research concluded to stop interviewing food experts.

The researcher bias relates to the interpretation of the gathered data wherein the researcher is always unconsciously affected by certain expectations of the study beforehand. Another limitation concerns the data analysis process. By using a fixed coding list, the study aimed to assess the gathered data systematically. During this process, some answers may have lost their context. This is, however, inherent to qualitative research (Bryman, 2012). Furthermore, the data quantity also affects this bias. Meaning, more data from interviews allows the researcher to understand the collected data better. Consequently, this better understanding can decrease the researcher bias.

Another issue is related to the conceptual framework. The TSI theory helped systematically assessing the impact of food waste prevention initiatives by predominantly focussing on their (new) ways of organizing, doing, framing, and knowing. The study,

however, does not engage in research beyond these initiatives. The extent to which the initiatives realize transformative change is thus based on their narratives. However, without quantitative data or stakeholder perspectives supporting these narratives, it is not easy to measure and evaluate their transformative power. Future research could also look better into the quantitative effects of transformative change by these food waste prevention initiatives.

The impact of food waste prevention initiatives is measured using assumptions that are derived from academic research. For example, the environmental impact assessment is based on statistics provided by the FAO (2013). However, this key figure includes all types of food, whereas some initiatives only focus on collecting specific types of food such as vegetables, fruits, or bread. Furthermore, the amount of food waste that the initiatives collect is also based on estimated guesses by the initiatives itself. Mainly because most initiatives do not monitor the amount of food they save. To solve this problem, the researcher could weigh or estimate the amount of collected food per food type for every initiative. However, to create reliable results, it is necessary to weigh or estimate this amount multiple times. This would take up too much time and resources since some initiatives collect more than 500kg. Nonetheless, for future research, it would be useful to do this in more detail.

The study also uses a Material Flow Analysis (MFA) of food waste in Amsterdam from Coudard (2019). This MFA is based on data from previous years and does not give an actual overview of the food waste in Amsterdam over 2019. Nevertheless, it does give a representative view of the food waste flows in Amsterdam. However, it is essential to note that data on food waste is always outdated, making a comparison with the data gathered in this

study ambiguous. Furthermore, the socio-economic impact of these initiatives is based on data from the interviews and assumptions. Due to limited time and resources, the study only focuses on the initiatives themselves and not on their users or partners. Therefore the socio-economic impact only gives limited insights into the degree these initiatives are socially active. Nevertheless, this study provides useful insights into how food waste prevention initiatives contribute to the prevention of food waste.

Lastly, it has been challenging to find food waste prevention initiatives willing to join the study. First of all, the landscape of food waste prevention initiatives is quickly changing, with new initiatives coming and going every couple of months. After selecting more than 15 eligible initiatives, only ten were still active in Amsterdam. Second, most initiatives run on volunteers who put in much effort and time to keep these initiatives running. Therefore some initiatives, such as BuurtBuik, Instock and the Voedselbank, were not available for an interview. Third, topics around food waste are extremely relevant nowadays, meaning that food waste prevention initiatives generally receive many requests for interviews. To illustrate, De Tweede Jeugd receives these kinds of requests almost every week. Eventually, six initiatives were willing to join the study through informal networks between these initiatives.

6.2 Novelty

This thesis provides useful insights in the governance of food waste prevention initiatives, their impact and the drivers and barriers influencing this impact. These insights correspond with the identified knowledge gaps in the existing literature on the impact of food waste prevention initiatives, which are also

apparent in Amsterdam, and knowledge gaps in the existing literature on governing food waste prevention initiatives and potential drivers and barriers.

By comparing the literature reviewed in chapter 2, this section addresses the knowledge gaps presented above. First, it will consider the implications of the study's results concerning the impact of food waste prevention initiatives. Followed by a comparison between the practices of food waste prevention initiatives and the existing literature. Lastly, it will compare the experienced barriers with the existing literature on barriers.

The impact of food waste prevention initiatives

The study shows that the environmental impact of food waste prevention initiatives is limited. The results show that there is still much room for these initiatives to grow. With a share 0.02% of the total commercial food waste in Amsterdam, the initiatives have not reached their limits yet. Moreover, the result implies that there is still much potential for other food waste prevention initiatives to start preventing food waste in Amsterdam. Concerning the socio-economic impact, it becomes evident that all initiatives believe that this impact is more critical than the environmental impact. By collecting leftover food, the initiatives aim to raise awareness of food waste and food waste prevention. In doing so, the initiatives acknowledge that they are aware that their impact is limited. However, with their activities focused on raising awareness, the initiatives also show that they are strongly committed to preventing food waste.

Furthermore, the results show that food waste prevention initiatives have not (yet) realized transformative change. This

means that the initiatives were unable to change current policies on food waste. Consequently, food waste prevention initiatives did not realize system innovation, which is an integral part of transformative change. This outcome corresponds with Avelino et al. (2019), who argue that change and innovation on all three levels (micro, meso, and macro) need to be taking place for transformative change.

Food waste prevention initiatives and social innovation theory

The best way to describe food waste prevention initiatives comes from Guerilla Kitchen and De Kaskantine. They see themselves as a "signaleringskeuken", a bottom-up initiative that observes a problem in society, in this case, the enormous production of food waste. This excessive amount of food waste is something it refuses to accept any longer, and therefore, it starts to address this problem by itself. It addresses problems as an individual, group, organization, and even a network. In doing so, it wants to raise awareness on societal problems and give people the right example to take action themselves and realize systemic change. This definition corresponds with the four elements of social innovation presented in chapter 2 in which the same rhetoric applies. Similar to "signaleringskeukens", SI initiatives also emerge from local collaboration. They address social problems in society that existing institutions have failed to resolve themselves. In doing so, SI initiatives introduce new ideas, products, and services that are perceived to be more productive, efficient, sustainable, or just. Moreover, with these innovative activities, food waste prevention initiatives also correspond with the TSI theory (Avelino et al., 2014; Haxeltine et al., 2016; Haxeltine et al., 2017; Avelino et al., 2019), in which SI must engage in new ways of organizing, doing, framing, and knowing.

Concerning the three levels of social innovation (Nicholls, Simon & Gabriel, 2015), food waste prevention initiatives mostly engage in incremental innovation. The initiatives provide goods and services to tackle market failures in the food system, such as overproduction and faulty stock management (Priefer, Jörissen, & Bräutigam, 2016). Instead of letting this food turn to waste, food waste prevention initiatives introduce innovative activities to produce products from food waste, such as grilled sandwiches or flavored powders, or services to redistribute this food waste among people concerned with food waste. These activities correspond with the food waste prevention strategies presented by the European Commission (2016), Priefer, Jörissen, & Bräutigam (2016), and Zimmerman (2017). Moreover, almost all food waste prevention initiatives work with food businesses that donate food, which is argued to be the main focus to prevent food waste by companies. However, this also shows that businesses do not change how their food system is organized, despite its flaws. Consequently, none of the food waste prevention initiatives can engage in institutional or disruptive innovation. This underlines once more that food waste initiatives have not yet achieved transformative change. Nevertheless, all food waste prevention initiatives have added a new element to the final part of the food supply chain.

Governing food waste prevention initiatives

Considering the ways of organizing, doing, framing, and knowing of food waste prevention initiatives, the study first and foremost shows that the initiatives have many different ways of organizing. Their organizational form is ranging from a one-person business to an LLC or foundation. This outcome coincides with arguments made by Davies (2019), who states that food sharing takes on

many different forms and shapes. The different ways of organizing also correspond with Davies' broad understanding of food sharing, wherein any activity related to food with more than one person counts as food sharing. Furthermore, the study shows no strong correlation between the organizational form and decision-making processes, since commercial and non-commercial initiatives use similar processes. However, the study does show various creative forms of decision-making, such as TBYW, Guerilla Kitchen, and De Kaskantine. These initiatives designed its decision-making process in such a way that safeguards their core values.

Secondly, the study shows that food waste prevention initiatives introduced various new ways of doing. In line with Davies' (2019) typology of food sharing, every initiative uses different ways to share food, such as collecting, gifting, and selling. This underlines the innovative capabilities these initiatives have in their ways of doing. Furthermore, the type of activities these initiatives engage in shows a strong correlation with how they are organized. Initiatives that focus on commercial activities use employees instead of volunteers. Especially TGTG stands out compared to the other initiatives in terms of partners, users, and sales. This difference can be explained by the way TGTG makes use of ICT. With its online application, TGTG is easily scalable. In contrast to other initiatives, TGTG does not have to set up logistics for collecting food and finding businesses willing to do this. Moreover, by only offering an online platform, all responsibilities remain at the businesses, including rules on food safety. This formula proves to be very successful, something initiatives such as De Tweede Jeugd, Guerilla Kitchen, and De Kaskantine admire. This formula makes food more affordable and allows businesses to sell their leftover food instead of wasting it. Furthermore, it also underlines the argument of

Davies (2019), who argues that ICT will play a vital role in increasing food sharing.

Thirdly, in terms of framing, the study shows that food waste prevention initiatives all strive for the same thing: the prevention of food waste. However, visions on the necessary means to prevent food waste differ sharply between the initiatives. The majority of the initiatives believe that raising awareness of food waste is crucial. However, this finding does not correspond with research from the Dutch Nutrition Centre (Van Dooren & Mensink, 2018), which shows that 93% of Dutch households are already aware of food waste. Furthermore, 90% of Dutch households intend to waste less food. In contrast to the literature, food waste prevention initiatives still experience a lack of awareness. As mentioned above, half of the initiatives admire the formula of TGTG. However, some initiatives remain skeptical about this more commercially oriented way of preventing food waste. They believe that this part of the food sector is different from any other industry. In their opinion, it would mean that, when they expand on their activities and increase their impact, there would be no food waste to collect anymore. Furthermore, with regards to initiatives' view on food waste prevention, almost all initiatives feel that they are merely scratching the surface when it comes to preventing food waste. They believe that the current food system is flawed, which leads to enormous amounts of food waste. Some initiatives even argue that food waste prevention initiatives only treat the symptom of the disease and not the disease itself. However, by collecting food waste, all initiatives hope to raise awareness of food waste and, by doing so, change the food system.

Lastly, with regards to new ways of knowing, the study shows that all initiatives share information using either their website or

social media. This corresponds with Davies (2019), who argues that ICT makes it easier to share food. Especially TGTG clearly shows the possibilities ICT can offer food waste prevention initiatives. However, in contrast to Davies (2019), many food waste initiatives also still rely heavily on informal networks. Especially with regards to finding partners for the collection of food. It turns out that face-to-face contact remains vital in sustaining these initiatives. Besides, when examining the use of networks, the study shows that half of the initiatives are not part of any network, while the other half are part of different networks. However, some initiatives maintain informal relationships with each other, though these relationships only became visible by studying them. Nonetheless, this outcome corresponds with Mulgan et al. (2007), BEPA (2010), and Chalmers (2012), whom all argue that SI initiatives are often too busy with themselves and forget to share information with other SI initiatives. Something TGTG and TBYW acknowledge and also aim to improve. Moreover, many initiatives strongly believe that it is only possible to have a significant impact when all food waste prevention initiatives work together.

Barriers for food waste prevention initiatives

The barriers experienced by the food waste prevention initiatives show similarities and discrepancies with the existing literature on barriers for SI initiatives. Consequently, the study also provides insights into new barriers.

Firstly, in correspondence with BEPA (2010) and Chalmers (2012), most of the initiatives experience a lack of funding. This lack of funding leads to limitations in expanding their activities, such as purchasing new cargo bikes, paying for logistics, or hosting an extra diner. Although this does not necessarily mean

that, without subsidies or investors, these initiatives will not sustain themselves, the study shows that in order to branch out and expand, initiatives feel that subsidies could help.

Secondly, the political and legal barriers largely correspond with the existing literature, especially regarding how institutions govern food waste prevention initiatives. In line with Davies (2019) and BEPA (2010), the municipality of Amsterdam has not found a way to support these initiatives. The majority of the initiatives express not feeling supported by the municipality. The municipality uses a one-size-fits-all approach in which new ways of organizing, such as social enterprises and off-grid initiatives, are not recognized. This attitude is emphasized by an experienced lack of awareness among councilors within the municipality, which, in line with Phillips et al. (2015), hampers the support for food waste prevention initiatives. This lack of urgency among councilors has also watered down to businesses and households, creating a cultural barrier in which all the initiatives notice that businesses do not care about food waste. The current policy of not separating biowaste is enhancing this. Notably, in contrast to Davies (2019) and BEPA (2010), food waste prevention initiatives do not experience any legal barriers due to the municipality's one-size-fits-all approach. Moreover, most initiatives do not feel limited by these municipal regulations.

Thirdly, contrary to the literature (BEPA, 2010), the research shows that most initiatives do not experience a lack of knowledge and skills as barriers within their organizations. Most initiatives were already familiar with the food industry before they started their business, while others quickly gained much experience through other activities. Only TBYW acknowledged that it sometimes misses expertise, for instance, when applying for funding. Furthermore, only Healthy & Affordable mentions

the difficulties of training new volunteers. Nonetheless, the initiatives do agree that there is a lack of knowledge among businesses and politicians. This finding touches upon the arguments made by Phillips et al. (2015) and corresponds with the lack of support that food waste prevention initiatives encountered.

Fourthly, in contrast to BEPA's (2010) arguments, food waste prevention initiatives do not consider a lack of monitoring as a barrier. The study shows that most initiatives have monitored their impact for at least a short period in their existence. However, this monitoring stopped since it was too much work, and they did not see the point after all. As said, most initiatives feel that their impact in terms of food waste prevention is negligible compared to Amsterdam's total amount of food waste.

Fifth and last, a barrier that has not received much attention in the academic literature are organizational barriers. The research shows that more than half of the initiatives experience an organizational barrier. Examples of such barriers are finding volunteers, employees, and a suitable location for their activities. Especially finding a suitable location is mentioned surprisingly often. Currently, all initiatives have a location to employ their activities. However, the research shows that it is difficult for these initiatives to find a (new) location without a steady income, which could be a problem for new initiatives. For example, Guerilla Kitchen had to cancel their free diners and limit the number of visitors using a raffle system, TBYW cannot expand the number of activities within the same building, and De Kaskantine has spent their money on moving locations and now lacks the money to pay rent. Furthermore, Mourad (2016) underlines the importance of setting up a logistical system to connect leftover food with food waste prevention initiatives

effectively. However, he does not highlight the crucial role of volunteers in setting up this system. In line with Mourad (2016), the study shows that food waste prevention initiatives need to be reliable and discrete when it comes to picking up food. However, in many cases, they rely heavily on volunteers to do so. Especially for initiatives that run on volunteers, it is crucial to have enough trained volunteers because access to volunteers determines the amount of food that these initiatives collect and the type of relationship between the initiative and food businesses.

6.3 Broader relevance

An important question remains: what do the results mean for food waste and SI initiatives in general? Concerning food waste in general, the study shows that the current food system is flawed due to overproduction, faulty stock management, and a lack of knowledge and awareness of food waste and food waste prevention. The efforts of food waste prevention initiatives to tackle these flaws can inspire food businesses, politicians, and councilors to take action themselves. Their efforts and their stories could help raise awareness of food waste and food waste prevention. Additionally, the experienced barriers could help municipalities and businesses outside Amsterdam to adjust their policies towards food waste prevention initiatives. Despite their efforts and hard work, the results show that these initiatives have a limited impact on food waste prevention because they mainly work individually. Therefore food waste prevention initiatives need to unite and work together. By sharing knowledge and resources, and jointly organize activities, food waste prevention initiatives can increase their impact. Moreover, in doing so, food waste prevention initiatives can stimulate a movement that unites all food waste prevention. A tightly organized movement

could make businesses, households, politicians, and councilors more aware of the problem's size.

Furthermore, this thesis shows that food waste prevention initiatives have a strong correlation with SI initiatives in other areas of expertise. Similar to food waste prevention initiatives, initiatives that focus on other areas are often organized in the same manner using volunteers. Another similarity is that they both aim to make the world a more just and better place. Therefore, the study's results are also relevant to SI initiatives working in other areas of expertise. Many SI initiatives could learn from new ways of organizing, doing, framing, and knowing of food waste prevention initiatives. However, it should be noted that food waste prevention is inherently different from tackling social problems such as racism or inequality.

This thesis also provides useful lessons for food waste prevention initiatives that focus on other ways to prevent food waste, such as farming or digestion. Especially the results concerning their organizational abilities could be beneficial for starting food waste prevention initiatives nationwide.

Lastly, the study also touches upon the interdisciplinary field of Industrial Ecology (IE), which consists of three aspects, namely the analytical (natural pillar), technical (engineering pillar), and implementation aspects (social pillar)(Korevaar et al., 2004). The explorative research on the impact of food waste prevention initiatives in Amsterdam mostly touches upon IE's social pillar. In correspondence with IE's social pillar, this study focuses on the role of food waste prevention initiatives within the current food system in Amsterdam. By studying the initiative's ways of organizing, doing, framing, and knowing to prevent food waste, and to what extent these initiatives realize transformative change

it contributes to social pillar elements: transitions and learning processes, social systems analysis, and environmental management systems. Lastly, the research also studies the drivers and barriers experienced by the initiatives which provide insights into environmental policy tools related to food waste prevention.

7

Chapter 7: Conclusion and recommendations

This chapter presents the main conclusions of this thesis. The answers to the sub-questions eventually lead to an answer on the central question: *What is the impact of food waste prevention initiatives in Amsterdam?* Finally, this chapter concludes with recommendations for policymakers, food waste prevention initiatives, and future research.

7.1 Conclusion

The first sub-question aimed to provide insights into how food waste prevention initiatives contribute to the prevention of food waste in Amsterdam. It focussed on the people behind these initiatives, what drives them, how they see food waste, and what they are doing to prevent food waste. In order to systematically answer this question, the study uses the conceptual framework introduced in chapter 3.

1. What are the daily practices of food waste prevention initiatives?

Engaging in commercial or non-commercial activities strongly influences the ways of organizing, doing, framing, and knowing of an initiative. In terms of organizing, this characteristic becomes visible concerning the use of employees and volunteers. Concerning doing, food waste prevention initiatives introduced various new ways to prevent food waste. This underlines their innovative capacity. In doing so, all initiatives, along with their partners, added a new cycle to Amsterdam's food supply chain. Furthermore, in terms of framing, the bottom line of all future visions is the prevention of food waste, whether that is by increasing sales or expanding on activities. Lastly, with regards to knowing, initiatives primarily use the same channels to spread information. However, the initiatives currently do not structurally share information with other initiatives, which hinders them from sharing their expertise. This lack of sharing is unfortunate since all initiatives have valuable experience in their efforts to prevent food waste.

2. How do drivers and barriers faced by food waste prevention initiatives exert influence over the upscaling of their activities?

Food waste prevention initiatives face various barriers in their efforts to prevent food waste. Although every initiative experiences these barriers differently, they all limit the activities to some extent. Economic barriers mainly concern a lack of money that holds back expansions in terms of renting locations or increase production. Organizational barriers mainly limit activities through a lack of trained volunteers and finding suitable locations for activities. Cultural barriers mainly concern a lack of appreciation among businesses, councilors, and politicians, limiting initiatives to expand their activities and find

more partners. This lack of appreciation is encouraged by political barriers that touch upon a lack of urgency among councilors and politicians, limiting their understanding of food waste prevention initiatives. Lastly, the initiatives experience a lack of knowledge on food waste and food waste prevention among businesses, households, politicians, and councilors. In sum, as Coby from Healthy & Affordable strikingly said, "food waste prevention initiatives have problems in their whole chain". Sustaining motivation to overcome these barriers is, therefore, the most critical driver. Consequently, losing motivation is destructive for the future of the initiative. This interdependence also explains the vast number of initiatives that emerge and fail.

In resolving these barriers, the majority of food waste prevention initiatives believe the municipality plays a vital role, despite their skepticism towards the municipality's transformative power. In addition to policy measures such as increasing taxes on food waste collection and treatment, the municipality also needs to start actively supporting food waste prevention initiatives.

3. What is the current environmental impact of food waste prevention initiatives?

Collectively, food waste prevention initiatives saved approximately 214,000 kg of food in 2019. With 68% TGTG is responsible for the lion share of the amount of saved food. The environmental impact of food waste prevention initiatives on the total amount of commercial food waste in Amsterdam is 0.02%. This impact not only illustrates the enormous potential for food waste prevention initiatives in Amsterdam but also underlines the importance of what these initiatives are doing. Moreover, compared to the total amount of food waste in Amsterdam, which is approximately 75,000 tonnes of food waste, the

initiatives have a marginal impact of 0.003%. Nonetheless, food waste prevention initiatives have a significant environmental impact in terms of CO_2-eq. emissions. The initiatives prevented approximately 530,000 kg of CO_2-eq emissions. In sum, the enormous amount of food waste in Amsterdam stipulates that the collection of food waste on itself is vital and that raising awareness on food waste prevention is highly necessary.

4. What is the current socio-economic impact of food waste prevention initiatives?

Despite saving a respectable amount of food waste, all initiatives acknowledge that they are merely scratching the surface with their work. Therefore, the majority of the initiatives, see the collection of food waste primarily as a means to raise awareness. Apart from raising awareness through the collection of food, most initiatives also raise awareness through their website and social media. In doing so, the initiatives mainly pay attention to food waste in general and ways to prevent food waste. In addition to providing information, a small number of initiatives also focus on the activation of people and help build their capacity to prevent food waste. Concerning social interaction, all initiatives stimulated social interaction to some extent. However, often this interaction was unintentionally stimulated, such as the act of making a purchase. Only a limited number of initiatives organize activities to stimulate social interaction of high quality, such as diners and workshops. Concerning the economic impact, commercial initiatives mainly contribute to the local economy in terms of employees, whereas the non-commercial initiatives contribute to the affordability of food. This increased affordability of food, combined with increased awareness and social interaction, makes the socio-economic impact prevail over the environmental impact. Food waste

prevention initiatives offer more than just saving food waste, some also take on an active role within the community and serve as a place where every week, more than a thousand people from every class, gender or race gather to share food and contribute to the prevention of food waste.

5. To what extent can the activities of food waste prevention initiatives be considered transformative?

Although food waste prevention initiatives demonstrate their transformative ambition and potential, they have not yet achieved a transformative impact. Despite their hard work and admirable ambitions, the initiatives currently lack the transformative power to realize system innovation. Therefore they were not able to realize any change of direction in the policies related to food waste. This lack of transformative power is induced by the fact that most initiatives work individually, do not engage in politics, and have no networks within the municipality or government. Additionally, food waste prevention initiatives also experience a lack of awareness and recognition among politicians, councilors, and businesses. Consequently, food waste prevention initiatives are now in a position wherein they strongly oppose the municipality and businesses. This confrontation means that system innovation is still far from occurring. Nonetheless, food waste prevention initiatives display transformative potential as long as they work together, share knowledge, and share networks. By bundling their forces, the initiatives increase their transformative power and can start developing their ideas on how to prevent food waste. This co-creation can take on many different shapes and forms. Food waste prevention initiatives could assist each other in the collection and redistribution of food waste. Initiatives that have a surplus in food waste, or a type of food that they do not use, can

redistribute this surplus to other initiatives. In doing so, food waste prevention initiatives can jointly organize a logistical system that efficiently redistributes leftover food to the people and initiatives that need it. Furthermore, food waste prevention initiatives can collectively organize workshops on food waste prevention, allowing for food waste prevention initiatives to share their expertise with a broader audience. By doing this, food waste prevention initiatives collect more food waste, but they also reach more people. Consequently, by increasing their impact, food waste prevention initiatives cannot be ignored by the municipality. Moreover, the municipality can even play an essential role in facilitating these networks.

To conclude, this thesis shows that it is difficult for food waste prevention initiatives to realize an impact. They are confronted with barriers in almost every aspect of their activities. Despite collecting a significant amount of food waste, food waste prevention initiatives are still merely scratching the surface compared to Amsterdam's total amount of food waste. The initiatives are aware of this and primarily focus on raising awareness of food waste and food waste prevention. Thereby, the initiatives reach thousands of people but fail to reach politicians, councilors, and food businesses. Consequently, food waste prevention initiatives have not yet realized system innovation and transformative change. Nonetheless, they show high potential for changing the food system as long as they establish strong networks.

7.2 Recommendations

Recommendations for food waste prevention initiatives

First of all, it is crucial for food waste prevention initiatives to build a strong relationship with the municipality. Many initiatives are currently not concerned with politics. However, to realize systemic change, it will need to convince policymakers to take action on preventing food waste. Knowing who is responsible for policies concerning food waste is the first step to start exerting influence on potential new policies. A strong relation could also increase the support for food waste prevention initiatives. Consequently, this will also lead to more recognition, awareness, and knowledge among policymakers for food waste prevention initiatives and their efforts to prevent food waste.

Secondly, food waste prevention initiatives should have a sharper focus on activating people and building capacity. Currently, the majority of the initiatives only provide information on food waste and food waste prevention. By providing more workshops and do-it-yourself kits, food waste prevention initiatives can offer people more tools to prevent food waste at home. This learning-by-doing could be more effective than merely providing information on how to prevent food, such as information on food storage.

Lastly, food waste prevention initiatives should put more effort into establishing strong networks with each other. As said, by sharing knowledge and working together, food waste prevention initiatives could increase its organizational capacity. Consequently, food waste prevention initiatives can also increase

transformative capacity. When establishing networks, food waste prevention initiatives should also look for partners beyond food waste, such as SI initiatives focused on other social problems such as poverty or inequality. These initiatives could also have potentially relevant experience for food waste prevention initiatives.

Recommendations for the municipality

The study shows that the municipality and food waste prevention initiatives are on opposing sides. Moreover, the initiatives do not feel acknowledged and supported in their efforts to prevent food waste. This lack of support is caused by an experienced lack of knowledge and urgency in tackling food waste among policymakers. Consequently, the initiatives do not believe the municipality can change the current food system. In order to improve this relationship and close the gap between food waste prevention and the municipality, this thesis provides some recommendations for the municipality to implement.

First of all, it is recommended that the municipality opens a digital service point where food waste prevention initiatives can find information on funding, regulations, networks, and other initiatives. In addition to providing necessary information, this service point also allows the municipality to take on a facilitating role in the exchange of expertise between the initiatives and possible collaborations. Furthermore, the municipality's extensive network can assist food waste prevention initiatives in finding volunteers, funding, partners, and locations.

Secondly, to help food waste prevention initiatives, the municipality needs to set up a food waste taskforce. This taskforce, consisting of advisors and data scientists, needs to

assist food waste prevention initiatives and monitor flows of food waste in Amsterdam. By making sure all food waste prevention initiatives register themselves at the digital service point, the municipality creates an overview of who is currently actively preventing food waste. Furthermore, the taskforce can assist food waste prevention initiatives to monitor the amounts of food they collect. Based on this information, the municipality could substantiate new policies aimed to prevent food waste.

Thirdly, it is recommended that these new policies focus on discouraging overproduction and faulty stock management of food businesses. The municipality should look into the implementation of new policies such as increasing taxes on food waste collection and disposal, and more relaxed rules for the production, distribution, and selling of products made from food waste. These new policies may positively affect the total amount of food waste. Moreover, this could lead to businesses valuing food more fairly and stimulate them to prevent as much food waste as possible. However, it is important to note that these policy interventions should not lead to increased food prices. Therefore, it is vital to prevent food businesses from rolling off the costs from a failing food system on the consumer.

Lastly, apart from food waste prevention, it is recommended that the municipality explores the possibilities of collecting food waste separately. Especially the valorization of food waste is one of the most promising flows for cities to target (Zeller et al., 2019). In doing so, the municipality in Amsterdam can realize its ambitious goals towards a circular economy.

Recommendations for future research

This study provides new pathways for future research that could provide useful insights to help the prevention of food waste in Amsterdam and other cities. Therefore all recommendations for future research are relevant for Amsterdam and other cities nationwide.

First of all, it is vital to research the transformative impact of food waste prevention initiatives in more detail. By only interviewing initiatives themselves, this thesis provided useful insights into their efforts to prevent food waste but leaves gaps in the effectiveness of their activities with regards to system innovation. In order to fill these gaps, future research must focus on the efforts of food waste prevention initiatives from a political and business perspective. When it comes to assessing their socio-economic impact in more detail, it is necessary to interview the users of food waste prevention initiatives. This can provide new insights into the effectiveness of their activities. Future research is needed to measure the prevented amount of food waste and its environmental footprint concerning the environmental impact.

Secondly, this research only provided insights into the barriers experienced by food waste prevention initiatives. However, to provide insights into steps to successfully tackle these barriers, further research is necessary. Studying initiatives that failed could provide additional insights into barriers for food waste prevention initiatives.

Thirdly, it would be interesting to see what food waste prevention initiatives can learn from other SI initiatives in terms of new ways of organizing, doing, framing, and knowing.

Lastly, it would be interesting to examine the role of strong networks with regard to the impact of food waste prevention initiatives. Therefore studies need to explore the dynamics around strong networks and how these networks support food waste prevention initiatives in their efforts to prevent food waste. Possible research pathways are co-creation and co-evolution of food waste prevention initiatives.

8

Chapter 8: References

This chapter presents all consulted academic literature, internet sources and other means of information to serve the purposes of this thesis.

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9

Chapter 9: Appendices

This chapter contains all the appendices. All appendices are listed below:

- Appendix A: Conceptual framework for backcasting experiments
- Appendix B: Conceptual framework sustainability transition experiments
- Appendix C: List of interviewees
- Appendix D: Interview guideline
- Appendix E: Code list

Appendix A: Conceptual framework for backcasting experiments

Quist, Thissen, and Vergragt (2011) developed a conceptual framework to measure the impact of a particular participatory backcasting experiment (see also figure 9.1). Over the last decades, participatory backcasting experiments have proven itself as an adequate tool to address complex problems related to sustainability. Nevertheless, the impact on the short term (5 to 10 years) and long term (over 30 years) were previously not known.

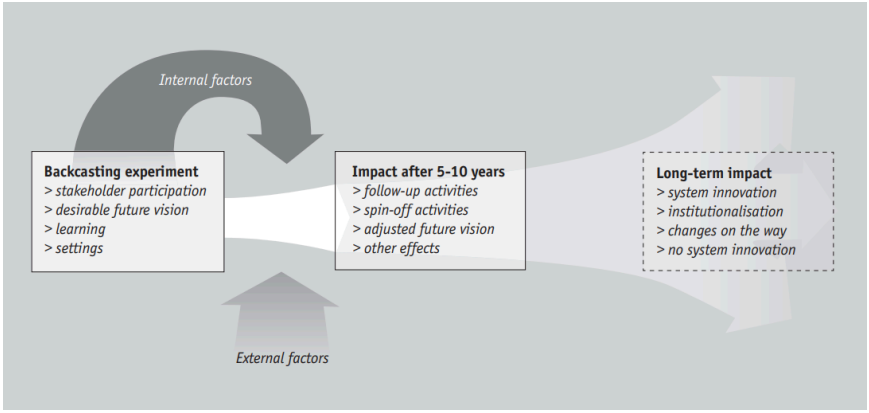

Figure 9.1: Conceptual framework for measuring the impact of participatory backcasting experiments. Source: Quist, Thissen & Vergragt (2011).

Participatory backcasting experiments stand in contrast to forecasting: not set up towards the future, but looking back from a vision of a desired future to determine pathways or a roadmap to reach this future vision. The participatory backcasting experiments consist of four building blocks that are important for the potential impact of these experiments: (1) stakeholder participation, (2) future visions, (3) learning, and (4) settings and methodological aspects. In participatory backcasting experiments, broad stakeholder participation is crucial for gaining expertise and increasing legitimacy and accountability.

Stakeholder participation is measured using the variables of stakeholder intensity (how strong are stakeholders involved?) and the type of stakeholder involvement. A future vision provides guidance (what to do) and orientation (where to go) for the involved stakeholders. Guidance and orientation are also the two variables to measure the future vision building block. Learning is an essential condition to increase awareness and change behavior and is about the ability of stakeholders to deal with problems and changes individually and in groups. Lastly, settings and methodological aspects are about the characteristics of the experiment. These are measured using the variable of how the experiment is applied.

Internal and external factors influence the level of impact of these participatory backcasting experiments have on their surroundings. In this context, internal factors come from the backcasting experiments itself; in other words, they can be understood as the characteristics of the backcasting experiments. External factors originate from the surroundings of the backcasting experiment, also known as the socio-technical context in which the experiments are active. Combined, both internal and external factors exert influence throughout the backcasting experiment in its journey towards the desired future.

The four building blocks of the backcasting experiment and the internal and external factors provide a tool for measuring the short-term impact of the experiment. This short-term impact starts a new phase for follow-up and spin-offs, which consists of three new building blocks: network formation, future visions, and institutionalization.

Appendix B: Conceptual framework sustainability transition experiments

Luederitz et al. (2016) aimed to provide a framework that makes it possible to evaluate if a sustainability transition experiment achieves the desired result. Moreover, it also aims to provide insights into how this result is accomplished. The framework builds upon four evaluative dimensions: (1) Inputs (what was invested in the experiment?), (2) processes (how was the experiment completed?), (3) outputs (what was generated by the experiment?) and (4) outcomes (what was accomplished by the experiment?). However, instead of using the traditional sequence, Luederitz et al. decided to change the sequence by using outputs and outcomes as a starting point, after which processes and inputs are evaluated. Figure 9.2 shows how this sequence resembles. The primary focus of this framework lies in the outputs and outcomes. In other terms, what was generated and what was accomplished.

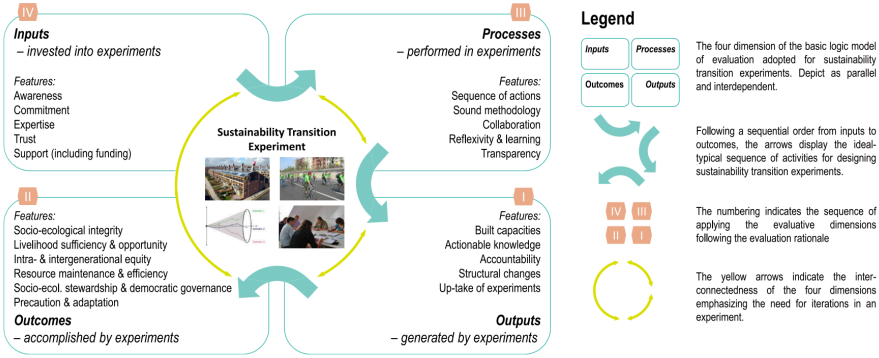

Figure 9.2: Framework for sustainability transition experiments. Source: Luederitz et al. (2016)

Each dimension constitutes a set of features that are evaluated using indicators and a guiding evaluative question. The outputs are the direct impact an experiment has and is evaluated using features such as capacity, skills, commitment, realizing changes in physical and social structures, and potential of the experiment. Outcomes put direct results in a broader context to see what was accomplished in terms of sustainability. It is evaluated using features such as socio-ecological integrity, livelihood, intra- and intergenerational equity, use of resources, governance, and adaptation. The processes are the actions taken to generate the outputs and outcomes. Features are a sequence of actions, methodology, and the extent of collaboration, learning, and transparency. Lastly, the inputs are the investments in the experiment, which are evaluated using the features awareness, commitment, expertise, trust, and support.

Appendix C: List of interviewees

Table 9.1: Overview interviewees. Source: author

Initiatives	Person	Position	Date	Duration	Location
De Tweede Jeugd	Benjamin Namane	Founder of De Tweede Jeugd	06-12-2019	1 hour and 15 minutes	Cafe de Jaren
De Kaskantine	Menno Houtstra	Founder of De Kaskantine	23-12-2019	1 hour and 30 minutes	De Kaskantine
Too Good To Go	Jurjen de Waal	Food waste campaigner at Too Good To Go	03-01-2020	1 hour and 10 minutes	Telephone interview
Healthy & Affordable	Coby Babani	Founder Healthy & Affordable	24-12-2019	2 hours	Healthy & Affordable HQ
Taste Before You Waste	Isabel Allen	Coordinator Taste Before You Waste	08-01-2020	1 hour and 30 minutes	Dokhuis (Taste Before You Waste HQ)
Guerilla Kitchen	Elise Struyck	Founder Guerilla Kitchen	18-12-2019	5 hours and 30 minutes (tagged along with the collection of food waste)	De Nieuwe Anita (Guerilla Kitchen HQ)

Appendix D: Interview Guideline

Organizing

- Who are you and what is your role in the initiative?
- What is the story behind the initiative? How did it emerge?
- What are the initiative's core values and how does it promote these values?
- What is the organizational structure? How many employees and volunteers are involved?
- How does the initiative come to decisions?

Doing

- What are the activities of the initiative and who are involved (e.g. partners)?
- How much food does the initiative collect from its partners on a weekly/monthly/yearly basis?
- Who are the customers/clients/users of the initiative? And does the initiative have insights in how many customers/clients/users is has?

Framing

- What is the future vision of the initiative for the short and long term?
- What is your personal vision on tackling food waste in general?

Knowing

- How does the initiative produce knowledge? Does it use websites, workshops, blogs, expositions, etc?
- Does the initiative monitor and evaluate its activities? If so, how has the initiative learned from its activities and what has it improved? Furthermore, what still needs improvement?
- How does the initiative share and spread knowledge? What channels does it use?

- Does the initiative share knowledge with other food waste prevention initiatives?

Barriers and drivers

- What are the main drivers for a successful execution of the initiative's activities?
- What are the main barriers that limit the initiative's activities and potential expansion?
- What are the main drivers and barriers for preventing food waste in general (e.g. nationwide)?
- What is your view on other food waste prevention initiatives? What are in your opinion positive and negative developments in the food waste prevention initiative sector? Think of mobile applications or commercial initiatives.
- What roles could the municipality and government fulfill in tackling the barriers for food waste prevention initiatives?
- How could the municipality create the right conditions for food waste prevention initiatives to thrive?

Appendix E: Code list

1. Organizing
    - 1.1 Origin initiative
    - 1.2 About yourself
    - 1.3 Organizational structure
    - 1.4 Core values
2. Doing
    - 2.1 Activities
    - 2.2 Partners
    - 2.3 Clients and users
    - 2.4 Amount of collected food
    - 2.5 Amount of sold products
3. Framing
    - 3.1 Goals
    - 3.2 Vision and future activities
        - 3.2.1 Short-term vision and future activities
        - 3.2.2 Long-term vision and future activities
    - 3.3 Vision on food waste in general
4. Knowing
    - 4.1 Producing knowledge
    - 4.2 Monitoring and evaluation
    - 4.3 Sharing knowledge
    - 4.4 Networks
5. Barriers for initiative
    - 5.1 Political barriers for initiative
    - 5.2 Economic barriers for initiative
    - 5.3 Cultural barriers for initiative
    - 5.4 Legal barriers for initiative
    - 5.5 Organisational barriers for initiative
    - 5.6 Other barriers for initiative

6. Barriers in general
    6.1 Political barriers in general
    6.2 Economic barriers in general
    6.3 Cultural barriers in general
    6.4 Legal barriers in general
    6.5 Organizational barriers
    6.6 Other barriers in general
7. Drivers and preconditions
8. Municipality of Amsterdam
9. Other initiatives
    9.1 Positive
    9.2 Negative
    9.3 Missing
10. Tackling barriers