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BRINGING VALUE TO WASTE:

How entrepreneurs are changing the way we use and view food waste

Abstract:

The waste of edible food presents one of the most pressing issues we face in the 21st. Several entrepreneurs are innovating on ways to use surplus or wasted food, attempting to change how society views and uses it. Entrepreneurs are engaged in the valorisation of food waste or surplus to create new, marketable products, which not only save food, but create economic benefit. However, the practices these entrepreneurs use when valorising food and creating their business models are not well understood. This research applies literature on strategic niche management to the use of food waste to create new, value-added products. Strategic niche management (SNM) is used as a tool to construct and manage niche innovations in a way that helps guide them towards their full potential in replacing unsustainable practices or products. 11 innovators from food waste start-ups were interviewed, and their practices were compared to literature on strategic niche management. Barriers to their activities of start-ups were also identified. Finally, a reflection was made on the potential success of the innovations in scaling-up, and their future potential to change dominant practices around how food waste is used using literature from SNM. It was found that the respondents implement practices from SNM in their activities of valorising food waste and surplus. Specifically, respondents engaged in practices related to creating shared visions of how to use food waste and creating social networks. The use of these practices are of particular importance for future scaling-up of these innovations. However, learning practices were not as well implemented. The practices were found to be particularly useful in overcoming barriers to the valorisation of food waste, and in future scaling-up activities.

Key words: *food waste, surplus, innovation, strategic niche management*

Management Summary:

Food waste is a growing problem in the 21st century. Currently, several private actors are innovating on the valorisation of food waste and surplus, creating value-added products that can be sold on the market. In addition to providing an economic solution to this problem, these innovations are often *social*, meaning that they attempt to address a social problem. Unlike technical innovations, social innovations attempt to create a new way of doing things, instead of a technical innovation which creates a product that does something new.

In literature so far, social innovations in the context of food waste are currently underrepresented in literature, and thus the practices that these actors use when valorising food waste or surplus are not well understood. Thus, this study attempts to contribute to literature and theory on this topic. To further academic discussion, the theory applied here is *strategic niche management* (SNM). SNM focuses on the proper construction and management of niche innovations, and describes three major practices that innovators can implement to ensure the adoption of their innovations. However, SNM has not yet been applied to the niche of valorising food waste, and has only been applied to social innovation in limited contexts, so this study also contributes to academic dialogue on the usefulness of SNM in these contexts.

11 start-ups involved in the valorisation of post-consumer and market food waste and surplus were interviewed. They 5 topics were asked to understand the extent to which they use practices related to SNM; the creation of shared visions, the creation of social networks, learning, the management of values, and the management of future activities. In addition to assessing the extent to which these SNM practices are used and their appropriateness in the context of food waste valorisation, a reflection was also made on the future of these innovations.

Results indicated that, while nearly all start-ups interviewed engaged in activities related to the creation of shared visions, creation of social networks, management of values and planning for future activities, few engaged in learning activities. This is likely due to theoretical difficulties in the measuring of learning and the age of the respondents. Additionally, the application of SNM in this study highlighted some shortcomings of the theory, specifically in regards to applying it to social innovation.

The start-ups and their plans for future growth and development of their innovations were reflected on. It was found that because of the use of basic SNM practices such as creating shared visions and creating social networks, they will have future success in their activities of valorising food waste and surplus.

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Ch.1 Introduction:

As the global population grows, more pressure is exerted on resources. The production and subsequent waste of food contributes greatly to these pressures. In the United States and European Union, 40% and 50% (respectively) of food is wasted each year throughout the entire supply chain (Gustavsson et al., 2011). 25% of post-consumer food is wasted in U.S. households, and citizens in the Netherlands waste 8-11% of food each year, resulting in approximately 270-400€ losses per person (Parfitt et al., 2010). In developed countries, the causes of food waste are considered to "be driven by the low price of food relative to disposable income, consumers' high expectations of food cosmetic standards, and the increasing disconnection between consumers and how food is produced" (Parfitt et al., pg.3078, 2010). This disconnect is increasing rapidly with rates of urbanisation, as urban populations are further removed from the agricultural areas within which food is produced (Godfray, 2010a). Urbanisation increases the dependence of the consumer on a food retailer which contributes to food wasting behaviours (Armar-Klemesu, 2000). In the developing world, a lack of infrastructure (such as refrigeration) paired with a lack of managerial skills leads to waste in all parts of the food supply chain (Parfitt et al., 2010). Post-harvest losses, in both developed and developing countries, also present an immense amount of waste. Exact numbers vary on how much food is lost from this, but some researchers estimate it is around 10% globally, and can reach as high as 50% in the tropics (Magan & Aldred, 2007).

A less visible problem of food waste, however, is the environmental damage it causes. When food decomposes in a landfill, it releases methane (CH_4), a greenhouse gas that has 20 times the global warming potential of CO_2. Many other resources are lost when producing food that will ultimately be wasted. Food waste contributes to significant energy losses in terms of what goes in to produce it, as well as the energy lost from within the food itself (Griffin et al., 2009; Parfitt et al., 2010). Minimizing food waste "from an ecological standpoint…promotes environmental sustainability by conserving energy resources, reducing environmental costs of burning fossil fuels, protecting microhabitats, and preserving water and air quality" (Griffin et al., 2009, pg.69).

Attempts to address the complex issue of food waste cross multiple disciplines, including political science, economics, management, and sociology. In February of 2015, France passed legislation to remove "best by" dates from fresh foods in supermarkets, which had been described as entirely arbitrary (Thompson, 2015). This was followed by a unanimous decision

from the French Parliament in May, 2015 which "bars supermarkets from purposefully spoiling unsold food and will require them instead to donate such produce to charity or sell it for animal feed" (Thompson, 2015). Other countries are following France's example. The U.K. has recently introduced a voluntary program with supermarkets to reduce food waste through donations. Companies like Tesco have announced that they will be partnering with charities and food banks to donate unwanted food (Thompson, 2015). Recently, a Danish supermarket called WeFood has begun selling expired food, cosmetics and household items that are too near to their expiration date for other stores to sell (Ma, 2016).

The EU Commission is also taking steps to address this problem on a European scale. In December of 2015, the Commission adopted a "Circular Economy Package" aimed at initiating policies to work towards creating a zero waste Europe. In addition to promoting resource efficiency, the package aims at reducing food waste at the source and promoting legislation to ensure edible food is not tossed out (European Commission, 2015).

In addition to these policy changes and actions from corporate actors, media and social campaigns are bringing attention to the issue. In 2014, two Canadian filmmakers released the documentary "Just Eat It" in which the two attempt to live a life with zero food waste. The intention of the film is to bring awareness to how much food is wasted and how difficult it is to live a completely waste free life (Rustmeyer & Baldwin, 2014; www.foodwastemovie.com). Popular political talk show host, John Oliver, has also begun an awareness campaign on food waste after an episode on the topic on his show "Last Week Tonight", a show with an average viewership of over 1.5 million people per episode (Oliver, 2015). The rise in the popularity of urban farming also indicates a growing change in awareness of many urbanites in addressing topics of food security and food waste (Thomaier et al., 2015, pg.44).

While these initiatives to address the problem of food waste are invaluable, the problem cannot be tackled through policy change and social awareness alone. Changes in how surplus food is used and valued are also needed.

1.1 Food Waste & Social Innovation:

In addition to these social and political changes, innovations in how to use food waste and food surplus are developing. Many of these are built around the valorisation of food waste, in which the waste or surplus is transformed in to a "new" product that is sold on the market.

Entrepreneurs and researchers are experimenting with the potential of using valorised food to create an economic and market solution to this problem. Researchers are studying the potential for food wastes and surplus to be used to create new, value-added products (Luque et al., 2013; Bayer et al., 2014; Mirabella et al., 2014). In addition to serving environmental goals, many of these innovations serve social purposes: to bring value back to food that is considered "waste" by remarketing it as a new product, and creating an awareness within society that food is edible and valuable despite cosmetic damages or sell-by dates. This idea of remarketing or valorising wastes is not new, and has been practiced in other sectors. Remarketing wastes from other products, such as cellular phones, has been shown to reduce costs and overall wastes for companies and consumers (Stahel, 1997; Vrij et al., 2006; Kissling et al., 2012; Hill, 2014).

The valorisation and remarketing of edible foods is a promising alternative to landfilling, incineration, and composting. Innovations in the use of waste or surplus food present a market-based opportunity where entrepreneurs and companies can create some kind of profit. Innovators throughout the world are already creating products which take surplus food from markets that would otherwise be thrown out and turn them in to edible products, such as soups or powdered fibres that can be added to foods (FSEN, 2016). The goals and practices of these innovators are as diverse as the products that they create. Some focus first and foremost on prevention, by working with organisations to change practices that might create food waste. Others focus on raising awareness through their products, by educating or making known to consumers the ways in which food waste or surplus can be used. Some are connectors, linking food surplus to those in need, or distributors, who collect food and give it to those in need. On the product end, there are processing businesses and restaurants, which collect surplus and turn it in to a new product to be sold (FSEN, 2016).

These innovations in the handling and processing of food surplus or waste present alternatives to common methods of dealing with food waste. They also present business opportunities to socially minded entrepreneurs, often called social innovators. Many entrepreneurs are already involved in business activities aimed at addressing social and environmental problems related to food waste. The Food Surplus Entrepreneur Network, a worldwide platform connecting food surplus entrepreneurs to resources and others in the field, hosts over 200 in their network (Food Surplus Entrepreneur Network, 2016). While the products these entrepreneurs are creating are not necessarily "innovative" in and of themselves, the processes they use to create them are. With these alternatives emerging, and business models being created around them, it is

increasingly important to investigate the practices and strategies of these start-ups in academic research.

The amount of resources spent on producing food that will not be eaten is a growing problem in developed and developing countries alike. Creating business models around valorisation provides a potentially profitable alternative to landfilling, but is still in an experimental phase. Thus, it is relevant to study the strategies entrepreneurs and the potential of their innovations, as they could lead to a more sustainable food system.

1.2 Research Questions:

With changes in policy and social awareness, market opportunities are opening up for entrepreneurs interested in working with the valorisation of food waste, as well as opportunities for using extending the use of food to reduce business costs. Still little is known about the strategies and practices start-ups use when re-marketing the waste.

Thus, the overarching question of this research is:

- *How do entrepreneurs valorise and remarket food waste and surplus?*

Additional sub-questions are:

- *What strategies and practices do they use when valorising and remarketing food waste?*
- *What barriers do they encounter when valorising and remarketing food waste, and how are these managed?*
- *What are the potential consequences or impacts of their strategies on the future of the remarketing of food waste?*

1.2.1 Research Aims & Relevance:

The first sub-question aims to identify which strategies and practices entrepreneurs and start-ups use to remarket food waste. Here, theory on *strategic niche management* is applied. Strategic niche management literature suggests a number of strategies and practices that innovators can use to aid in the success of an innovation on the market. Strategic niche management has only been applied to social innovations in limited contexts (Witkamp et al., 2011; Smith, 2006), thus this research also tests the viability of strategic niche management

for food waste or surplus innovations. The second sub-question is more exploratory, and aims to understand if there are generalizable barriers that entrepreneurs face, and how they manage these. After answering these questions, an analysis from a strategic niche management perspective is made on the consequences and impacts the use of these practices has on the future of the innovations.

1.3 Literature Review:

To enhance familiarity with the topics at hand, literature review was conducted on food waste valorisation and social innovation. While social innovation is not the focus of this research, it is important to gain understanding and familiarity with the concept as the actors working with food waste valorisation are social innovators.

1.3.1 Valorising food waste:

Several researchers are already engaged in the possibilities and opportunities of using food waste to create new, value-added products. The valorisation of biomass (not just food, but all biomass) is not a new concept. The most common use of valorised biomass is for energy, but given the pressure put on petroleum for plastics, researchers are now experimenting with using biomass as a material alternative for plastic (Tuck et al., 2012). Only in recent years, however, has research begun on the use of *food wastes* for material creation.

Studies on food waste valorisation span various steps in the supply chain, but mostly focus on wastes produced during industrial processes. A 2014 study analysed the potential of valorising food wastes coming from manufacturing, as 39% losses come from these processes (Mirabella et al., 2014). The aim of the study was to understand if wastes produced could be used in other industries to enhance industrial symbiosis. They found through extensive literature review that the wastes produced from vegetable, fruit, and dairy manufacturing can yield valuable compounds (Mirabella et al., 2014). Two studies conducted in 2013 found that food wastes from industry could contribute to the use of green chemical technology (Luque & Clark, 2013; Lin et al., 2013).

Studies on the use of valorising post-consumer food waste have also been done. A study from Zhang et al., (2013) found that waste from bakery products could be used to extract succinic acid, an important food additive and compound in polymers. This study was done in cooperation

with Starbucks Hong Kong, and used excess bakery products from stores to extract the succinic acid.

Aside from chemicals, experimentation has also been done to create bioplastics from food waste. In 2014, Italian scientists synthesized the first ever bioplastic made from edible vegetables (Bayer et al., 2014).

It is important to note, however, that the valorisation of food wastes or surpluses does not need to involve such technical processes. The traditional definition of the term is increasing the value of a product by introducing a value-adding labour activity (Musto, 2008). Studies on social innovations in valorising food waste are not yet present in the literature. Thus, currently, most academic literature on innovations in food waste valorisation come from highly technical fields.

1.3.2 Social Innovation:

The waste of edible food is an inherently socio-economic problem. As food is thrown away, whether it be for cosmetic reasons, overproduction, or mislabelling of expiration date, valuable resources are lost and that food is kept from being consumed by someone who needs it. Thus, innovations that aim to address this problem must also be inherently social. In order to better understand what exactly social innovation entails, a literature review must be made.

Social innovation "refers to innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly diffused through organisations whose primary purposes are social" (Mulgan, 2006, pg.146). In the traditional definition of innovation, an innovation is the creation of a new product that "*does* something" (Witkamp et al., 2011, pg.669), while a social innovation innovates on the *way* of doing something. While most innovations are aimed at creating some sort of profit, social innovations are aimed at solving a societal problem. Social innovations have come to the centre over the past several years because "existing structures and policies have found it impossible to crack some of the most pressing issues of our time – such as climate change, the worldwide epidemic of chronic disease, and widening inequality" (Murray et al., 2010, pg.3). Social innovations provide broader, more inclusive solutions to these problems.

There are several distinctions between social and technical innovations, beginning first with "the intended result of each" (Cajaiba-Santana, 2014, pg.2). In traditional management literature, the process of technical innovation is defined as "the profitable exploitation of a new

idea" (Stewart & Fenn, 2006, pg.), whereas social innovations "brings up social change that cannot be built up on the basis of established practices" (Cajaiba-Santana, 2014, pg.2).

Social innovations are not done only within a business, profit context. In fact, many social innovations stem from the non-profit sector. Mulgan (2006) offers two lenses through which social innovation can be examined. The first is through the lens, social change is "portrayed as having been driven by a very small number of heroic, energetic, and important individuals" (pg.148). The second sees individuals not as the origin of innovation, but as drivers and carriers of it. This kind of social innovation, for example, can be seen through initiatives like GreenPeace.

Social innovation, however, does have its limitations. Some scholars argue that the designing social innovations is often difficult to do (Mulgan, 2009; Hillgren et al., 2011). Particularly, some limitations of the design of social innovation are "the lack of economic and organisational, inabilities in driving the implementation process, the high cost of design consultants who often do not have long-term commitment to the projects, and the superficiality of some proposals due to the fact that by ignoring the evidence and field experiences of designers tend to 'reinvent the wheel'" (Hillgren et al., 2011, pg.172). Witkamp et al., (2011) also reports that social innovations often have difficulty gaining institutional support due to the non-economic focus of their activities.

There is currently no literature on social innovation around food waste or surplus in particular, and thus this research hopes to contribute to a better understanding of food surplus innovations in this field. Additionally, current literature on the place of social innovation in strategic niche management is also limited, so this study hopes to contribute to discussion on the compatibility of these two theories. This is deemed as relevant and necessary, as studies conducted on food security and food waste call for innovations, technical and social, in order to fully address this problem (Godfray et al., 2010b).

1.4 Theoretical Framework:

The main theory applied in this study is strategic niche management. However, this theory finds its base in the multi-level perspective on socio-technical transitions and transition management, so it is also necessary to include this theory in the framework. This perspective is key to understanding interactions between niche and regime actors when developing new,

innovative products or practices. An operationalisation and concise definitions of the practices analysed in this study are also given. Finally, the criticisms of the theories are considered.

1.4.1 Strategic Niche Management:

Given the need to transition towards more sustainable practices and technologies, many researchers question if it is possible to "intentionally [construct] a desirable path" (Kemp et al., 2001, pg.69) towards sustainable alternatives. In reflecting on this, *strategic niche management* (hereby referred to as SNM) has been developed (Kemp et al., 2001; Hegger et al., 2007; Schot & Geels, 2008). The formal definition of SNM is "the creation, development, and controlled phase-out of protected spaces for the development and use of promising technologies by means of experimentation, with the aim of (1) learning about the desirability of the new technology and (2) enhancing the further development and rate of application of the new technology" (Kemp et al., 1998, pg.186). Scholars developed SNM in the 1990s, after observing that many innovative, sustainable technologies "never leave the showrooms, or worse, remain on the shelves of laboratories as prototypes" (Romijn et al., 2010, pg.334).

SNM is similar to transition management, but varies in specific ways. While transition management "takes a societal problem as a starting point and sees a search- and learning process as a solution" SNM "poses the question which trajectories a technology or technological system could follow to fundamentally change an existing socio-technical regime" (Loorbach & van Rach, 2006, pg.8). SNM is chosen for this study given its focus on innovation as a solution towards changing unsustainable regimes, as the case studies researched work with these kinds of innovations.

This field is grounded in *socio-technical transition theory.* This is the study of the dynamics of different technologies in society, and is often visualised with the *multi-level perspective* (fig.1). In this, three levels are nested within a socio-technical system. The micro-level, the niche, is a protected space in which "radical innovations" can be developed (Geels, 2004, pg.912). These niches have rules that guide and inform practices, but they are not as firmly established as within the socio-technical regime at the meso-level. Rip & Kemp (1998) describe a regime as the "rule-set or grammar embedded in a complex of engineering practices, production process, technologies, product characteristics, skills and procedures, ways of handling relevant artefacts and persons, ways of defining problems; all of them embedded in institutions and infrastructures" (p.340). In this complex network of actors and firms, routines and rules are

established and contribute to path-dependency (Geels, 2004). Regimes are generally quite stable, but influence from other levels or conflicts within the regime networks can create windows of opportunity for regime shift and change.

The macro-level, the socio-technical landscape, provides "even stronger structuration of activities than regimes" (Geels, 2004, pg.913). The landscape is the larger contextual environment within which the niche and regime levels exist. Landscapes are not easily influenced by these lower levels, but can exert pressure on them. Pressure on the regime from the landscape (e.g.: climate change) can cause disruptions within these networks, opening up windows of opportunity for niche innovations to scale-up. These different levels and their coordination can be seen in fig.1, from Geels (2002).

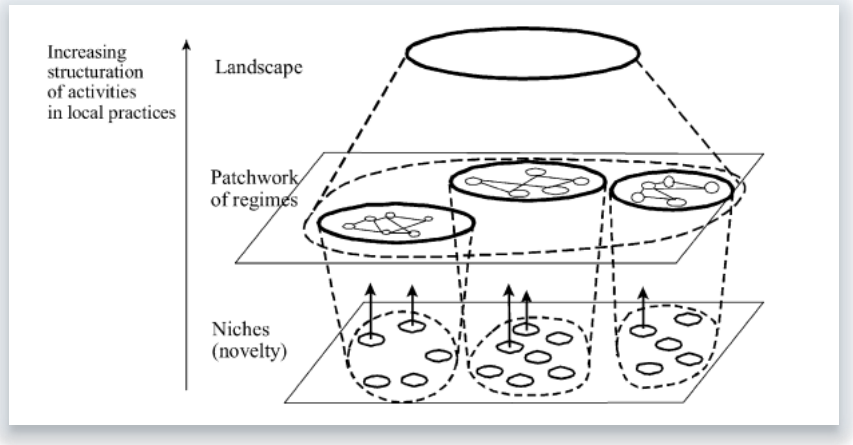

Figure 1: The multi-level perspective on socio-technical transitions (Geels, 2002)

These different levels are not meant to be "ontological descriptions of reality", but are aimed at providing "analytical and heuristic concepts to understand the complex dynamics of socio-technical change" (Geels, 2002, pg.1259). The focus of this research is primarily on the development and emergence of the food waste valorisation niche, but in analysing these niches, it is important to understand the dynamic interactions they have with the incumbent regime. Thus, the MLP provides a lens in which to view this.

To better visualise this, MLP can be applied to the valorisation of food waste and surplus. In this, imagine that the technological niches are different entrepreneurs, start-ups, universities or other innovators developing alternative products made from food waste or surplus. The regime,

then, is the network of food distributors, producers, and retailers, as well as the already established ways of disposing of food (landfilling, incineration). The landscape is the overarching societal, cultural, and environmental context. While protected spaces, niches are still influenced by these contexts in their development and scaling-up. Landscape changes, such as societal awareness of the problem and climate change, are putting pressure on the current regime and how food waste is handled. At the same time, niche innovations are being developed that find more sustainable and profitable uses for food waste or surplus. This pressure from both the top and the bottom begins to create changes within the regime. These changes are already visible, as governmental bodies such as the EU have become interested in the development of a circular economy or a bio-based economy. If this pressure continues, there is the potential for these innovations within the food waste/surplus niche to break in to the regime, and replace some of the dominant practices. However, careful management of these niches is first needed.

SNM, thus, has developed as a way to guide niches through these multi-level transitions to create regime change. SNM focuses on the appropriate construction of niches, so that they may "act as building blocks for broader societal changes towards sustainable development" (Schot & Geels, 2008, pg.537). It was developed for niche innovations which are "socially desirable…serving long-term goals such as sustainability" and for "radical novelties that face a mismatch with regard to existing infrastructure, user practices, regulations, etc." (Schot & Geels, 2008, pg.539). SNM scholars study how niches can be "steered", by external actors or via internal strategies and processes, towards a desired future to create social change (Schot & Geels, 2008; Kemp et al., 2001).

In SNM literature, three internal practices are identified as influencing the successful emergence of a technological niche to create regime change. The first is **the creation of expectations and visions**. These are important in the process of niche management and transitions, as they set a direction in which development must go. In the case of food waste, an example of this would be how the entrepreneur envisions their product as helping to solve the larger problem of food waste, and how they plan each step in their strategy to address it. Additionally, this could involve creating a shared vision of what regime change looks like, and the roadmap or strategy the start-up uses to achieve that.

The second process is **the building of social networks**. This concerns not only involving relevant stakeholders in the development of the niche, but also in the linking and networking with regime actors outside of the niche (Schot & Geels, 2008). Social networks are also seen as a tool to overcome barriers, as external stakeholders may be able to provide resources to

innovators (eg: financial aid) to allow them to more easily confront start-up issues (Hoogma et al., 2002). Social networking also involves contact with users of the product, such as through demonstrations or market research. Social network building with users should aim to include them in the development of the innovation, so as to ensure adoption by users in the long-run (Hegger et al., 2007).

Several research projects conducted on failed niches show that the absence of **shared vision creation** or **building of social networks** practices is likely to result in the extinction of the niche (Hoogma, 2002; Raven, 2005; Schot & Geels, 2008). Thus, the proper implementation of these practices is very important.

Finally, **the learning process** is critical to niche success. For a more exact definition, Bingham & Halebilian (2012) define learning as a "systematic change in cognition and/or behaviour" (pg.153). Learning can be performed in a variety of different ways, such as through learning-by-doing (gaining experience) and reflection on negative experiences and how to improve (Bingham & Halebilian, 2012).

Grin and Van de Graaf (1996), further specify that learning should not be merely "first order", but should be second order, or double-loop learning. Learning is perhaps the most difficult practice to perform, and also to measure, especially in young organisations or in entrepreneurs.

There is debate from several scholars over what can be considered learning, and how to measure that in young companies or start-ups (Bingham & Halebilian, 2012; Harrison & Leitch, 2005; Politis, 2005). Still, nearly all scholars agree that organisation, entrepreneurs, or start-ups that do not engage in some type of learning processes will not be successful. This was again shown in studies conducted on failed niches (Hoogma, 2002; Raven, 2005; Schot & Geels, 2008).

Despite this debate over learning, there are some aspects of learning that have been identified as important to SNM. An essential part of this learning process, as Hegger et al. (2007) elaborate, is engaging with external stakeholders when managing niches. They claim that too heavy of a focus on the development of the technology itself can alienate external actors, thus hurting the acceptability of the niche. Transition management scholars such as Rotmans, Kemp, & van Asselt (2001) and Loorbach & van Raak (2007) further highlight the importance of creating a shared vision to guide niche practices in learning.

SNM has not yet been applied to the re-marketing of food waste. Part of the reason for this lack of application, is that the innovations done in the re-marketing of food waste are considered

social, as opposed to *technical*, innovations. A social innovation does not necessarily create an artefact that "*does* something" (Witkamp et al., 2011, 669), as does a technical innovation. Instead, social innovations culminate more in the development of a new *way* of doing something (Witkamp et al., 2011), such as the repurposing of food waste through creation of new business models that redefine how society views food. SNM, which stems from studies of socio-technical systems, all too often focuses purely on technological innovations, thus ignoring the "social" aspects of socio-technical systems. Applying SNM to social innovations can yield more insight in to how these systems change and adapt socially and culturally, and can complement studies of technical change (Witkamp et al., 2011).

When applying SNM to social innovations, it is thus important to adapt the theory to include analysis of practices relevant to them. Witkamp et al., (2011) do this by adding **the management of values** to their analysis of SNM when applied to social innovations. They argue that social innovations require a greater change in human behaviour, beliefs, and values. The values that these innovations involve must thus be carefully managed when introduced to the market. Smith (2006), in a study on the growth of organic agriculture niches, found that as these niches scaled-up, some values from the original initiatives were lost. So, even though organic food became more widely available, the value in the fact that the food was coming from a local, small farm was lost (Smith, 2006). This shows that in the process of transitioning from the niche, values upon which the niche was created can get lost or changed, thus limiting the extent to which regime practices are reorganized (Smith, 2006; Witkamp, 2011).

In addition to the practices discussed above, Kemp et al., (1998) explain that innovation and niche management "requires a special kind of management: the management of attention, of riding ideas in to currency, of managing part-whole relationships (integrating functions, organisational units and resources) and the institutionalisation of leadership" (pg.176). The above practices are meant provide ways to guide this management. While the internal practices relevant to SNM have been briefly described here, a full operationalisation of these practices can be found in Appendix I.

1.4.2 Niche Futures:

As SNM has been developed to understand how niches can be formulated and scaled-up to better create regime change using the practices discussed above, research has been conducted on the potential "futures" niches may have if managed with SNM. The extent to which niche

actors implement these practices indicates to some extent their ability to achieve success in creating regime change. These futures are used as a point of reflection for this research. Based on the extent to which respondents in this study express using practices related to SNM, a reflection can be made on what potential future the niche of food waste valorisation might have.

Several case studies have been conducted on the implementation of SNM practices on niche innovations. While the practice of these is not a set determinant for the success of the niche in creating regime change, the absence of these practices in niche strategies does correlate to their failure. Based on a multi-year case study of electric vehicles, Hoogma et al., (2002) describes four potential futures for niches based on their use of practices in SNM:

1) The niche remains purely technological, mostly operating through experimentation. New applications for the product may be found and then replicated. Through this continued experimentation, the niche may eventually develop enough to expand and upscale to the market.
2) The niche enters the market. Experiments on the application of the niche are "not necessary any longer, but users start to recognize the advantages of the novel technology and suppliers are willing to invest in production on a small scale" (Hoogma et al., 2002, pg.31).
3) The market niche expands, developing in new directions "leading to the emergence of new market niches" (Hoogma et al., 2002, pg.31).
4) The niche goes extinct. The niche fails to attract further support or funding. Some investment may remain, but little progress in development is made. However, learning from the failed niche experiment may be transferred to the development of another niche.

While these are generalised futures, and the reality of niche futures is far more complex, these four futures will provide a starting point for reflection on the niche of valorising food waste.

1.4.3 Critiques of Strategic Niche Management Theory:

Much of the criticism that SNM receives is related to its bottom-up approach to transitions (Berkhout et al., 2004; Nill & Kemp, 2009). Unlike other theories, sustainable transitions are seen in SNM as the successful management of a niche technology or process that replaces the existing regime. The importance of regime actors in these changes is thus often underplayed or ignored. However, one way of including the importance of regime actors when

applying SNM to the study of innovations is through the analysis of the social network development of the niches. Theoretically, niches that are able to better align themselves and get greater support from the existing regime are better fit to create change within it (Hoogma et al., 2002; Geels & Schot, 2007). Thus, when conducting studies in SNM it is important to consider the involvement of these regime actors in bringing support to the niches.

Additionally, some studies applying SNM have found that the application of good niche strategies alone do not necessarily lead to the successful emergence of the niche, nor to a regime change. Advocates of SNM acknowledge this, and instead advertise the usefulness of SNM as a tool for learning and network building to identify limitations of the innovation, and to create strategies to overcome these (Nill & Kemp, 2009; Hoogma et al., 2002; Van der Laak et al., 2007).

While not the same as SNM, transition management has been criticised for being exclusive to external actors, and limiting the voices of members of society, seeing them purely as consumers (Kenis et al., 2016). Again, while different, but somewhat overlapping theories, a similar criticism can be made for SNM. In their research on sustainable transport, Hoogma et al., (2002) even explain that they chose SNM and its technological starting point as it would avoid biases related to governance and economics. This technological focus could be interpreted as being exclusive to external actors. Interestingly, in this same study, the researchers found niches often failed due to their inability to include outside actors and stakeholders.

Continuing on this, SNM has been criticised by many scholars for being too technologically focused (Nill & Kemp, 2009; Witkamp et al., 2011; McMeekin & Southerton et al., 2012). Some work has been done to apply SNM to social innovations (Witkamp et al., 2011), but overall research on the application of SNM in the social innovation arena is limited. Furthermore, some scholars such as Hegger et al., (2007) and Witkamp et al., (2007) believe the limited focus on social innovations contributes to failure of SNM experiments. Thus, this study attempts to fill this gap by applying SNM to social innovations in the use of food waste.

Ch.2 Methodology:

The research questions in this study were explored through qualitative analysis of empirical case studies to test the research questions presented in the introduction. Literature review was conducted to further understanding of current research on food waste valorisation and social innovation. This mix of theoretical and empirical methodology is useful, as it has contributed to a more complete analysis of the research questions (Strauss & Corbin, 1998). This is especially important to do when addressing a complicated topic like food waste, which spans several disciplines and results in social and environmental damages.

Research to test the first question and hypothesis was undertaken in a primarily deductive manner, testing if strategies identified in SNM literature are used by food surplus entrepreneurs. After this, the research moved to addressing the sub-questions, reflecting on the consequences or impacts of these practices on the future of the re-marketing food waste.

2.1 Selection of case studies:

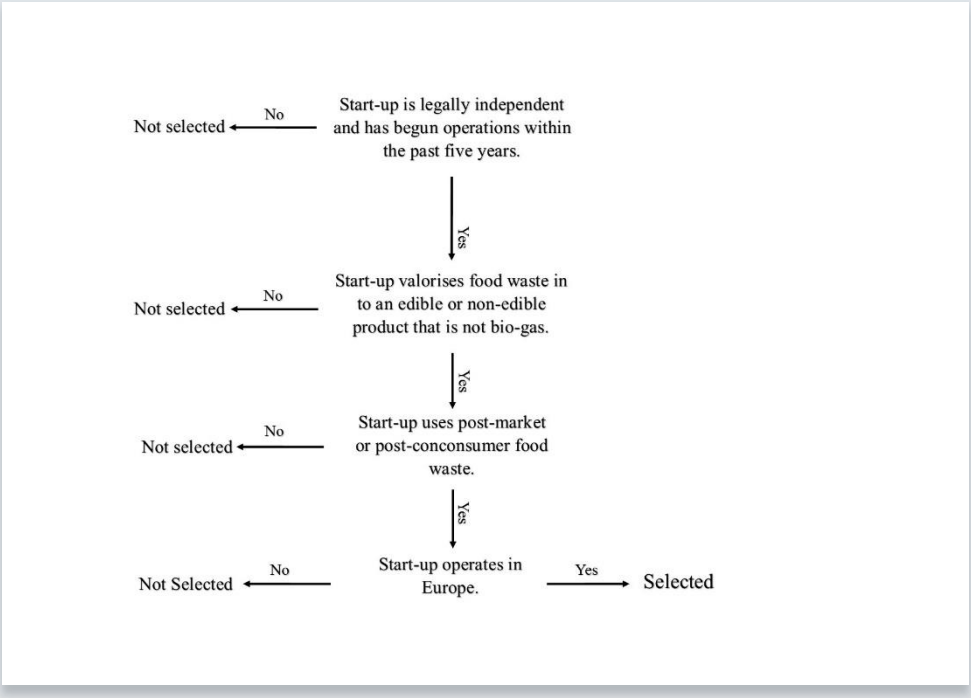

Figure 2: Selection criteria for case studies.

Case studies were chosen based on specific criteria (fig.2). Start-up companies were chosen as the unit of analysis as they present opportunities to develop and market new

technologies. While large, established companies are working with alternative uses for food waste, these are often applied on a purely experimentation basis. These experimentations are not generally sold on the market. Additionally, in existing, more structured organisations, new innovations often face tension, as innovations are sometimes seen as peripheral and not contributing to the strategic vision of the organisation (Kemp et al., 1998). Because of their informality and youth, start-ups are considered good incubators for innovation.

The start-ups used as case studies were first and foremost involved in the valorisation of a food waste or surplus, making it into a new product that is marketed for consumer use. This valorisation includes edible and non-edible products, but excludes products such as bio-gas. This decision was made due to the fact that bio-gas has been found to lead to "uncontrolled releases of methane" (Feng et al., 2010, pg.338). Thus, bio-gas is not considered to be a sustainable alternative to the landfilling of food waste. Additionally, entrepreneurs that focus purely on education about food waste or on re-distribution of food were not considered, as they do not sell their products directly on the market.

The start-ups chosen as case studies are legally independent and have begun operations within the past five years. They also express that the desire to address social and environmental problems of food waste are central to their business idea. Finally, the food waste that these start-ups use comes from excesses from the market, or from foods that failed to meet aesthetic qualities of consumers or markets. Surplus or waste from earlier in the supply chain was not considered.

The start-ups chosen were found mainly using the database of the Food Surplus Entrepreneur Network, which hosts names, descriptions, and locations of entrepreneurs innovating on ways to use food waste and surplus on their webpage (fsenetwork.org).

2.2 Preparation of Interview Schedule:

Interviews consisted of five questions, to understand the degree to which start-ups working with food waste create shared visions, social network, learn, manage values, and to understand what they personally perceive as a future for their company. Additional or follow-up questions were asked based on the development of the conversation, or to have respondents further elaborate on topics discussed. The interview schedule can be found in **Appendix II.**

2.3 Data Collection:

The primary method of data collection was through semi-structured interviews. Due to geographic restrictions, these were primarily done over the phone, although one response came via email and another was conducted in person. Interviews lasted approximately 45 minutes, and were semi-structured. Semi-structured interviews are valuable, as they "allow for spontaneous and in depth responses" from the interviewee (Baumbusch, 2010, pg.255). Additionally, semi-structured interviews offer the opportunity to better elucidate different variables and practices (Miles & Gilbert, 2005).

Interviews were collected for one month, and were made until data saturation was believed to have been reached. Data saturation is defined as the point in which no additional data is elucidated in interviews that contribute to answering research questions or to develop the conceptual framework further (Glaser & Strauss, 1967). This was done by first identifying a minimum number of interviews required, in this instance, 10, due to time and geographic constraints. After this number was reached, additional interviews were conducted to ensure no additional information could be found from continued data collection. Interviews were then transcribed.

2.4 Creating Codes:

After interviews were transcribed, the coding process began. First, interviews were read and quotes were put in to six main categories. These were *creating shared visions*, *social networking*, *learning*, *values*, *perceived future*, and *perceived barriers*. The first three were coded using the operationalised definitions of the practices, which can be found in **Appendix I.** *Values* were coded when the respondent discussed values important to start-up, how these were managed from the beginning, and how these might change as the start-up grows. The *perceived future* of the start-up was coded for when the respondent discussed the perceived path or future they believed the start-up was on, or what plans had been made for future growth. *Perceived barriers* were coded similarly. After this initial broad-category coding session, quotes were then coded in to more specific categories. These categories are shown in table 2 in **Appendix III**. Codes were tested for their validity by having a colleague use the code list and code one interview. While this was not an in depth test, it did show that the codes were reliable. The codes for the three main SNM practices (creating shared visions, social networking, and learning) are explained below.

It is important to briefly reflect on the limitations presented when coding SNM practices. As the practices have already been operationalised and succinctly defined by previous research, the definitions of what is considered part of an SNM practice can be limiting. Thus, some relevant practices may not have been coded for as they do not fall under the definition of an SNM practice.

2.4.1 Creation of shared visions:

Shared visions are defined by their type and how they were developed and pursued. Shared visions should be developed in such a way as to be achievable, replicable, and to inspire commitment from external stakeholders. The two broad categories of *type* and *performance* were thus chosen. This allows for a differentiation to be made of different goals held by entrepreneurs working with food surplus, and allows for an understanding to be made to the extent to which stakeholders were involved and how these goals are achieved.

Definitions of sub-codes are as follows:

- **Type:**
    - *(Physical) Impact:* This is coded when the respondent explains that the goal of the product is to reduce the (physical) impact of food waste. Impacts mentioned may be waste of resources, the increasing impact of food production, damages to natural world, and/or the desire to re-use food waste to conserve resources or extend the life-cycle of food.
    - *Awareness Building:* This is coded when the respondent explains that the goal of the product is to build awareness of the environmental or social impacts of food waste. Awareness building was considered a goal when respondents explained that their product/goal is meant to educate, set an example, change, or inspire others to value food.
- **Performance:**
    - *Consultation:* Consultation was coded for when the respondent expressed that conversations (i.e.: one to one interactions) were held with external stakeholders to develop the goal or the function of the business.
    - *Communicating Mutual Benefit:* Communicating mutual benefit is an important part of vision development, as it inspires commitment from external stakeholders, and gains their support in helping to achieve their

shared goals. This was coded when respondents discussed sharing benefits with their stakeholders when creating a shared vision.

- *Replicability:* Shared visions are considered replicable when the goals or models of the start-up are easily repeated by other potential entrepreneurs, outside of the initial contexts of their development.

2.4.2 Creation of social networks:

Social networking is a tool used not only to gain support and knowledge from experienced external stakeholders, but also as a way to manage barriers and opportunities. Social networking occurs when experienced stakeholders from the field are involved in the project (eg: as consultants), users are involved in the creation of the product, and support is created around the product, helping to ensure its success. The two broad categories chosen for this strategy are *stakeholders and suppliers* and *users.* These codes are chosen to differentiate between networking with technical and professional stakeholders and with users.

Definitions of these codes are as follows:

- **Stakeholders and suppliers**: This code is used when respondents refer to interactions involving external stakeholders and suppliers. Actions that are considered important are instances*:*
  - *Commitment* of stakeholders to the goals of the start-up, support of the project through the provision of resources (e.g.: funding, coaching), and
  - *Partnerships* made to further the accomplishment of the goals by the start-up.
- **Users:** Unlike partnerships, networking with users signifies that the start-up has done work to try to gain support and acceptability in their target user group. This can be done through creating:
  - *Relationships with users* by *involving users* in aspects of products development. It can also be shown through acts of
  - *Support* from the users themselves (e.g.: volunteering).

2.4.3 Learning:

Learning is perhaps the most important practice in SNM. Learning is used not only to gain technical knowledge and build competencies to help the functioning of the group, but also

as a tool to reflect on what has gone wrong, and what needs to change to make their group better. The two code categories chosen for this are *experimenting/testing*, and *reflection*.

Definitions of these codes are as follows:

- **Experimenting/testing:** Experimenting and testing is considered to have happened as a method of learning when demonstrations (market research, taste/product testing) are undertaken to enable a better understanding of how the product is accepted by the community. Experimenting and testing is also coded for when the respondent explains engaging in competency building activities.
- **Reflection:** Reflection is considered to have happened when start-ups, after experiencing a problem, reflect on it and consider changing their approaches or strategy.

These definitions of the codes served as guidelines for identifying instances of creation of shared visions, creation of social networks, and learning. Exact definitions were not made for values and the perceived future of the niche, as these were considered after interviews to be more exploratory than theory testing. Exact definitions for these were not available in literature, so definitions were created from data. The codes for these can be seen in table 4 in Appendix III.

Ch.3 Results:

11 representatives from 11 food surplus start-ups were interviewed for analysis. Four were founded in the United Kingdom, three in the Netherlands, one in Switzerland, one in Denmark, and one in Germany (table 1).

The average age of the start-ups interviewed was 2.5 years. Five of the respondents remarketed food waste by cooking it, and selling it as meals at restaurants and cafes. Four marketed surplus foods as snacks and other novelty foods: one sold juice made from surplus fruit and vegetables, one sold rejected vegetables as soups, another sold fruit leathers made from surplus fruit, and the last sold surplus bakery products collected from their partner bakeries.

One start-up marketed food powders, made from dehydrating surplus fruits and vegetables. The last start-up marketed an inedible product, a facial scrub, made from used coffee grounds collected from coffee bars. Due to concerns of confidentiality and intellectual property, the names of the start-ups and their representatives have been removed. In their place, pseudonyms (ex: respondent 1) are used. A list of these names and the description of their products are in table 1.

Table 1: Pseudonyms for respondents and product descriptions

Code Name	Product description	Location
Respondent 1	Bakery selling day-old products from neighbouring bakeries to reduce waste of these goods	Switzerland
Respondent 2	Powder made from dehydrated surplus fruits and vegetables.	United Kingdom
Respondent 3	Restaurant that collects food surplus from a national supermarket chain to create meals.	Netherlands
Respondent 4	Juices made from surplus fruit and vegetables.	United Kingdom
Respondent 5	Restaurant that collects surplus food from local markets and farmers to create meals.	Germany
Respondent 6	Restaurant that collects surplus food from local supermarkets to create meals.	Denmark
Respondent 7	A facial scrub made from used coffee grounds, from local coffee shops.	Netherlands
Respondent 8	Fruit leather snacks made from surplus fruit.	United Kingdom
Respondent 9	Global project of "pay as you feel" cafes that make meals from surplus food.	United Kingdom

Resondent 10	Soups made from surplus vegetables.	Netherlands
Respondent 11	Restaurant serving meals created from surplus food from the company's other stores.	Switzerland

3.1 Practices Used:

In the following section, a presentation and analysis of the results from the semi-structured interviews is presented. The three main SNM practices (creation of shared visions, social networking, and learning) is presented first. After this, a presentation of what values are important to the start-ups and how they believe these will be impacted by scaling-up is made. Then, a presentation of the futures the respondent's perceive for their start-up is shown. Finally, the main barriers and how they have impacted the start-ups is made.

Overall, it was found that these start-ups use practices detailed in SNM literature (eg: creating shared visions, social networking, learning, value management) to remarket food waste. The creation of shared visions and social networking were the most heavily emphasized strategies, with 10/11 start-ups explaining times in which they had engaged in these practices. Learning was the least practiced, but, as will be reflected on later, this is perhaps the most difficult strategy to perform and measure, and thus instances of practicing learning may not have been illuminated during the course of the interview. This could also be due to the relatively young age of these start-ups, which was on average 2.5 years. In the following sections, more detailed presentation of the results is given.

3.1.1 Practice 1 - Creating Shared Visions:

Interviewees were asked to comment on the goal or vision they had for the impact of their product. During the coding process, the responses were categorised in to the *type* of vision respondents had created and how these are *performed*.

Type

Two main types of shared visions were identified from the interviews. These were *reducing the (physical) impacts* of food waste (e.g.: disposal costs, environmental damages), and *building awareness* of the problem. Many respondents stated that the vision was central to their mission, and in some cases, guides everything they do. Respondent 8 said that:

"…everything we do is about tackling food waste, and as long as we have that overarching goal then we know we're heading in the right direction"

The desire to reduce the physical impacts of food waste inspired the choice of product for some. Respondent 4 reported to have experimented with several products before settling on juices. He explained that he had experimented with dehydrated fruit products and jams, but decided to remarket surplus as juice because:

With juice, [with] all the pulp, you're roughly getting half of it back in pulp. So, from those 8 tons of strawberries that I have juiced, there are exactly 4 tons of pulp. So it was dry pulp that can go, straight to animals. It can go straight to pigs, cows, anything really, sheep, and it can be mixed in with the other feed because it's processed…It takes a higher proportion. It was just like a win-win-win really, it was just the product I thought that would get it out there.

This not only allowed him to save more surplus from being thrown out, but also created multiple streams in which the by-products of the waste could be purposefully used. Additionally, according to the website of Respondent 4's company, they are currently investing in technology to turn food waste and by-products in to feed their electric generator (Respondent 4's website). For this respondent, reducing the physical impact does not only entail extending the life of the fruits he uses for his juices, but in actually making use of all the products and by-products created by it in useful ways.

Building awareness of the problems associated with food waste was another common theme for the visions these entrepreneurs created. Awareness building visions consisted of aspirations to educate the general public on the problem and to inspire others in the industry to change their practices regarding food disposal, or to engage in food saving initiatives themselves. Respondent 10 said of her company that they:

…wanted to tell people about food waste, about the waste of wonky veggies. As they are not on the shelves yet, we had to come up with a product that was telling this story. The product is also setting an example: we wanted to show that it is possible to make a high quality product out of waste. The goal is that other people follow our example.

Respondent 3 said of their vision:

We hope that a lot of people will follow. It doesn't matter if it's other consumers at home or supermarkets or producers of food or whatever. We just want to try to make it the new normal, the new standard.

This desire to build awareness and create an example of how food surplus can be used in a business context also points to their role as leaders in the niche, and shows ways in which this leadership can be managed (Kemp et al., 1998). As these projects develop, they become better

known and create awareness in others who may potentially decide to act. An example of these leadership activities was seen amongst the food surplus restaurants. Respondents 3 and 5 expressed that they had been inspired to begin their work based on the example of the restaurant from Respondent 6. By setting an example, Respondent 6's restaurant created awareness within actors in the field.

Customers were also the focus of this vision of awareness building:

> *We make the customers think and we make the bakeries think, and we can show them that there are possibilities that make sense against food waste. And that maybe it makes sense to stop that overproduction in households and businesses. –* ***Respondent 1***

Some of the respondents sought awareness building as well as reducing physical impact as central visions for their product. For example, Respondent 11 began his restaurant as a way to use surplus food from other stores his group operated, but also as platforms to educate the general public about food and sustainability. He reported that the food surplus restaurant:

> *"…was not only finding a solution for our shops, in the end it was also part of educational formation."*

The vision of building awareness seemed to have less influence on the type of product that was created, when compared to the vision to reduce the physical impact of food waste. However, respondents who reported awareness building as the vision of their company showed the most diversity in products they created, such as through restaurants, bakeries, soups, and snacks.

Those wanting to reduce the physical impact must do so in a way that ensures the food stays safe enough to eat. The best way of doing this is through preservation of the food, such as through dehydration or juicing. Thus, for those interested in reducing the physical impact of food waste consistently, the options to do so effectively are limited to preservation.

Performance

One of the key aspects of creating a shared vision is involving external actors so as to inspire commitment to the accomplishment of the goal. To assess if respondents *consulted* with external stakeholders to create a vision for their start-up, as well as plan strategy, they were asked how the vision had been created and who had been involved.

Only three respondents (Respondent 2, Respondent 3, and Respondent 11) directly stated that they had engaged in these kinds of consulting activities. These respondents expressed that this involvement had been important in not only creating their initial vision for the group, but also in guiding activities in the start-up. Respondent 2 said:

> *The first thing we did when we got this idea was we asked people from humanitarian organisations about what they thought of the product, and if it's something they could see being used. And whenever we've had progress, we've been in touch with these organisations. And whenever we discuss with the business managers we get their feedback as well on what they think and how this could fit in like a commercial model.*

Respondent 3 explained:

> *...we started with a board of inspiration, we call it. People who we think are inspiring, we asked them to think along with strategy. For example, Tony Chocolony, which is the chocolate brand, he helps us with thinking along with strategy.*

Respondent 11 explained that consulting benefited more than just his own initiative to use food surplus. This respondent had organised a roundtable discussion on food waste, and invited actors from around the country to come and learn from one another. He explained that this was important for topics like food surplus, as:

> *"...When it has to be socially sustainable, it needs collaborations."*

While few of the respondents directly discussed engaging with external stakeholders in the beginning stages of creating a shared vision, this did not seem to impact their ability to draw future support from the community, external stakeholders, or suppliers in later stages of the development of their food surplus products. Although consulting or collaboration were not reported in their activities when creating a shared vision, the websites of the respondents report partnerships with many different partners. Respondent 1's bakery, for example, has 55 partner bakeries, and additionally is a partner of 5 NGOs, including the WWF (Respondent 1's webpage).

Another important aspect of creating a shared vision is communicating, early on, *the mutual benefit* the vision holds for both those involved in the niche and outside of it. This further garners support for activities within the niche. Communicating this mutual benefit was done in a variety of different ways.

For some, benefits of cooperation and engaging with the start-ups in the shared vision were communicated to stakeholders and suppliers as a CSR or public relations story. Respondent 2

explained that in addition to reducing disposal costs for their supplier, their group acted as a *"CSR and marketing-tool"*, making it a *"win-win situation"* for both parties**.** Respondent 6 reported a similar story, explaining that when beginning operations, they were able to get attract of suppliers because *"they could see the PR story in it"***.**

Others simply framed the mutual benefit as a convenience. Disposing of food waste can be expensive and, depending on the country, highly regulated. Respondent 4 explained that farmers and suppliers saw the benefit in the convenience his collection brought them.

> *They don't really have to go out of their way too much, I mean, it's in their way. It was just a time and a place and I was there, and we had a very good agreement and arrangement from that.*

Others communicated the potential financial and marketing benefit. Respondent 1, whose company advertises which bakeries their products come from, so that it *"is very obvious who is the partner",* explained that this was done to allow the bakeries that partner with them to get some free advertisement. This is in addition to the small compensation they are paid for their day-old products. The respondent from this group further elaborated on this practice saying:

> *…since they've got another store in town where their products are sold, we often refer to bakeries who deliver their products to us. So, we might say 'ah, today we don't have the bread you're talking about but if you like it so much, you'll find it in the store about 10 minutes from here'. So, it's also an advertisement for them.*

This communication of mutual benefit can also be seen as a method of creating awareness, specifically within the start-ups' partner organisations. By communicating the benefits of partnering with them, of working with them to reduce the impacts of food waste, the partners are thus made aware of the impacts their processes have on this, and how they can rectify them. In this way, these creating awareness and the communication of mutual benefit are closely intertwined processes, and the practice of one leads to the practice of another.

The *replicability* of the shared vision is also essential in strategic niche management. Shared visions should not only be realistic enough to be achieved (Kemp et al., 1998), but should allow for application outside of their original contexts (Smith, 2006).

Interestingly, the restaurant from which Respondent 6 represents had created a vision that allowed for further application of their business model in other countries. This group, a restaurant located in Denmark that creates and sells meals from surplus food, had inspired Respondent 3 and 5 to engage in similar projects, located in Germany and the Netherlands.

When discussing their restaurant, Respondent 5:

…this we saw in the restaurant in Copenhagen. They do it in the same way and it works well. This is also what we'd like to do, have many people involved, spreading this message. And bringing their friends to the restaurant.

Respondent 3 explained that they hoped that in using this model to remarket surplus foods, they could convince people that:

...you can actually make a model around it where you can not just re-use it, but you can actually upcycle it, because we use products that are useless to supermarkets, but we make great meals of it by actually adding value.

Respondent 1 also expressed that the broadness of their vision and flexibility of their strategy were assets to future applications of their food-waste fighting model, as *"…It's a concept that you could so easily transfer to other places, especially with the products from bakeries."*

Respondent 11 also expressed that his innovation of a sustainable food network could be replicated anywhere, but stressed that it should not be a *"copying and pasting of the networks"* but that actors interested in creating more sustainable food systems and using food surplus should come together and learn, and then implement them in ways that are appropriate to their locale.

While not directly reported during the interview, the vision of the group from Respondent 9 also appears to be easily replicated. The model behind it is that any person inspired can contact the project coordinators and ask to open their own surplus food café. The group offers support in a "starter pack". According to the group's website, they currently have 27 cafes operating in Europe and the United Kingdom, and one in Australia. The group also announced recently on their social media page that there had been interest from supporters of the project in starting cafes on other continents. Respondent 9 from this group explained that volunteers can join the project and open cafes on their own, making it a flexible and easy model to participate in (Website, Respondent 9, 2016).

The main findings from the responses from these interviews are that the two main types of visions created do seem to influence the kind of product created. Those who created the visions aimed at reducing the physical (e.g.: environmental) impacts of food waste focused more on products that preserved food. Those who created the vision of spreading awareness had more diversity in the type of product they created, although many were restaurants.

Only three respondents directly stated that they had consulted with external stakeholders when creating their visions. This lack of consultation among the other participants, however, did not seem to impact the ability of the other respondents to attract support for their products.

Nearly all respondents engaged in activities related to communicating the benefits of their business or product to external stakeholders. This likely also contributes to the high levels of support they receive, as stakeholders see the value in participating in and giving support to these entrepreneurs. It is important to note that the benefits communicated were not always financial.

Finally, the replicability of the visions created by these start-ups were also apparent. As explained above, Respondent 6's restaurant model had inspired two other respondents to replicate the business in their home countries. The results from this section are further discussed in chapter IV.

3.1.2 Practice 2 - Social Networking:

Interviewees were asked to elaborate on who was involved in the creation of their product(s), and the impact that this involvement had. After transcription, their responses were divided in to two main categories: *stakeholders and suppliers* and *users.*

These two categories were used to differentiate between instances when the respondent was discussing interactions with suppliers/stakeholders and end-users. Table 2 shows the different stakeholders with which respondents created partnerships with, and what typologies those partnerships fall under.

Table 2: Typologies of stakeholder relationships

	With surplus producer	With government agency	With consultancy group	With NGO	With other business	With customers
R1	***X***	***n/a***	***n/a***	*	***X***	~
R2	***X***	***n/a***	***X***	*	***X***	***X***
R3	***X***	***n/a***	***X***	*	***X***	~
R4	***X***	***n/a***	***n/a***	*	***n/a***	~
R5	***X***	***X***	***n/a***	*	***n/a***	~
R6	***X***	***X***	***n/a***	*	***n/a***	~
R7	***X***	***n/a***	***n/a***	*	***n/a***	~
R8	***X***	***n/a***	*	*	***X***	~
R9	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***	~

R10	***X***	***n/a***	***n/a***	*****	***X***	*****
R11	***X***	***n/a***	***n/a***	*****	*****	*****
Key:						
X =	*formal, bi-lateral partnerships*					
***** =	*multi-stakeholder partnerships*					
~ =	*informal partnerships*					

The most common partnerships formed were formal, bi-lateral partnerships and agreements made with food surplus producers (e.g.: groceries, wholesalers). Only two groups directly reported creating a formal partnership with a government agency, and few made partnerships with consulting groups or other businesses. Many groups made agreements with multiple NGOs, creating multi-stakeholder partnerships, and nearly all respondents had made informal partnerships with their consumers.

Stakeholders & suppliers

From this sub-category, three main typologies of interactions with stakeholders and suppliers were identified: *creation of partnerships*, *commitment to the idea*, and *support from suppliers & stakeholders.*

Expectedly, nearly all of the start-ups had made formal partnerships with suppliers to ensure inputs for their products. There was one exception to this, which was the global initiative to reduce food waste by selling surplus food at cafes, Respondent 9. He explained that relationships with suppliers were not developed formally, as the food is donated voluntarily from multiple sources:

> *It wasn't [developed] because we get food from anywhere. So we get food from supermarket bins, anything that would be thrown away we went and got it. So we don't have to contact anyone. And we never really had to anyway, it just sort of came to us.*

The other start-ups interviewed, however, had created formal supplier partnerships. Respondent 4 even reported that his close relationships with his suppliers had been helpful in starting up, as

they had given him inputs for his products free of charge. Still, these partnerships needed to be managed carefully, and in some instances, mismanagement or miscommunication put strain on these partnerships. Respondent 5 said that after a news report ran about their group, one of their suppliers chose to quit working with them:

> *"He thought that he was shown as the bad guy, and we were the heroes saving the money. So we lost that one. We lost the supplier."*

In SNM, partnerships are meant to be used as tools to overcome potential barriers (Hoogma et al., 2002), and the start-ups interviewed used them as such. Respondent 6 explained that the logistics of picking up the food surplus had proved a barrier as the group does not own a car. This was partially managed, however, after the group partnered with a food bank. As the food bank often gets too much food for homeless shelters to handle, they now donate extra food to Respondent 6's restaurant, so that some of the strain is taken off the group when collecting food.

> *So we are the end station for the food bank truck…when it has been around to all the homeless cafes in Copenhagen, it stops [at our restaurant]. And we get the rest. So that way we get some food by car. – Respondent 6*

Respondent 10 expressed that they*"…had a strong feeling about packaging and marketing"* but *"…needed help with the technical development as we have no experience with that"***,** and thus again forming a partnership to develop this proved important in creating the product.

Partnerships were not only made with suppliers, but also other organisations. Several of the respondents interviewed reported having created a partnership with a charity or other social organisation. These types of partnerships served multiple purposes. Several start-ups partnered with external organisations, such as the Food Surplus Entrepreneur Network, to aid their access to resources and for network building purposes. Respondent 6 partnered with a Refugee Council. This partnership provided the start-up with funding and resources, and the start-up will soon employ refugees to help them further integrate in to the local community.

Partnerships with these kinds of organisations also served to help achieve the social aspirations of the start-ups, in some cases. For example, Respondent 8 expressed that her company had initially been interested in combating food security as well as food waste, but had not yet been able to do so yet due to their small size and lack of capitol. Thus in the meantime, her company partners with food charity organisations, by holding events with them and by donating some of their company's profits**.** While the group still has plans to directly combat food security

themselves, partnerships with charitable organisations currently act as a way to achieve this vision.

Partnerships created were not only just formal, bilateral agreements between two stakeholders. Several of the respondents reported that, after major partnerships had been made, other stakeholders also began to show their interest and commitment to the start-up and their idea. Respondent 6 reported that a public office offered their group workspace at a discounted price *"based on the surplus food concept"***.** Respondent 2 stated that her start-up received free consulting advice because the consultant *"just really liked the idea and what it represents"***.** Respondent 7, who creates facial scrubs from coffee waste, explained that she had experienced positive reactions from her partners, and saw that they were committed to helping:

> *Normally, coffee bars wouldn't be that interested in a beauty product but because of it being made of coffee waste, it's sold in coffee bars and that attracts a lot of coffee lovers of course.*

In addition to commitment to the idea of combatting food waste with these products, respondents also reflected on instances in which suppliers and external stakeholders provided financial, technical, or organisational help. Many of the start-ups interviewed did not have experience working with food or entrepreneurship, and thus support from external stakeholders was necessary.

Respondent 5's group had received a grant from their national government, which gave them not only money to start-up, but also a *"meeting room, meeting facilities, different start-up coachings and networking opportunities."***.** Respondent 3 explained that, through a partnership with the Youth Food Movement, her restaurant received support in networking, finding staff, and publicity. This start-up also works with the Impact Group, which helped them in scaling up their activities.

Respondent 4 explained that organisations at festivals at which he sells his product had also provided some financial support:

> *There are festivals where you pay upwards from 1000 to 2000 pounds for a pitch fee…but because we are doing what we are doing, they give it to us at a like 25% discount. Or they give us extra workers, like extra volunteer tickets…*

Users

External stakeholders and suppliers were not the only supportive and committed parties these start-ups worked with. The communities (e.g.: online communities, NGOs,) within which these start-ups worked, and their users, were also reported to have a significant impact.

Two of the respondents explained that their communities and users had provided support financially, through online crowdfunding campaigns. Respondent 5 stated that their crowdfunding initiative had raised 27,000 euros for the start-up. Respondent 4 has also recently begun a crowdfunding campaign. Respondent 8 expressed that crowdfunding has "massively shaped" what they are about:

> *We got a lot of contacts through that, it introduced us to people who have been helpful in developing [our business]. So there was about 280 people who backed our project, and, not all of them active or involved, but ya, our crowdfunding campaign had a huge impact on what we're about.*

Respondent 1 reported that she believes *"maybe [of people who visit their store] 60-70% are regular customers".* She went on to explain:

> *...that [our bakery] in Switzerland grew so much in 2 years, and became such a favourite place for many, many in town is connected to our humanity sort of. Because it's so important for how we relate to our customers, and our bakeries as well.*

User involvement in the actual creation of the product is considered an important, but often overlooked, aspect in SNM (Hegger et al., 2007). When end-users are excluded from the creation of a product that could provide a sustainable alternative to an established practice, the promises of this product might be lost. If users are not involved in the design of the product or practice, they might not be as willing to adopt the new alternative.

Many of the start-ups interviewed did engage in consultation with users and tried to include users and their communities in the creation of the product. This was done by the restaurants from Respondents 5, 6, and 9 by creating a platform in which volunteers from the community could join in on their project. Respondent 6's restaurant actually created *"volunteer teams"* in which volunteers could develop their own initiatives.

Respondent 2's group created an *"ambassador program"* in which interested persons could get involved, and the start-up would *"treat them as a partner"*. Social media also proved to be an important tool for receiving feedback and providing a way for users to get involved.

Respondent 8 and Respondent 10 stated that the product had been developed in consultation with their end-users. Respondent 8 explained that they had conducted pop-up events, where users tested different flavours of their snack. Based on their input, the group then chose to produce and sell the flavours that the community liked the most.

The practice of building social networks was the most heavily discussed by all of the respondents, and seems to be connected to the other SNM practices. 10/11 respondents had made formal partnerships with suppliers in order to ensure inputs for their products, and had created partnerships with other stakeholders (e.g.: NGOs, other businesses). Many of the respondents have also formed close relationships with their user communities, going so far in some cases to include them in their business model as partners.

The creation of these partnerships and relationships was essential for these start-ups in gaining not only financial support, but also support for the social change they are trying to achieve.

3.1.3 Practice 3 - Learning:

To understand how respondents engaged in the process of learning, they were asked how they had developed their product, and asked to discuss barriers they had experienced and how they managed these. Based upon their responses, instances of learning were classified in to two main categories: *experimenting & testing,* and *reflecting & changing.*

Experimenting & testing

Five of the start-ups interviewed engaged in experimenting activities. Most of this experimenting took place during the development of the product itself. As explained before, Respondent 4 tried various different products before settling on juice. He had tried dehydrated treats and considered jams, but chose juice in the end due to the frequency with which customers used the product, and due to its ease in production and physical impact in reducing food waste. Respondent 8 also explained that she and her partner considered and experimented with other products as well, such as pizzas, juices, and chutneys, before settling on fruit leathers.

Respondent 2's company *"did a feeding day, to test if the beneficiaries actually liked the idea of using food powder to improve nutrition"* after the first production of their product.

Respondents 3, 5, and 6 saw their restaurant as experiments in and of themselves. Respondent 3 said that they initially wanted to see "*if this concept worked to make people more aware of*

food waste", and because people liked the concept so much they determined it was *"a good way to reach more people and to actually increase the amount of food waste [they] rescued every day."*. The respondent from this restaurant, however, did state that they had learned that their food surplus restaurant concept was not the most efficient way to reduce the physical impacts food waste, and were planning on starting a product line to address both of their visions (creating awareness and reducing the physical impact of food waste).

The logistics of actually managing the start-up was another area in which many of the interviewees experienced times of learning through experimentation and testing. For Respondent 1, choosing locations for their stores also required a lot of experience:

> *The store itself, that's very important…You have to go there and spend a day in front of the store, and find out how many people are walking by. Is there a big school or university nearby? Because if so, that's very good for us. I think if you are in a bad spot, you can't run [our business model]*

Reflecting & Changing

When faced with challenges, it is often necessary for actors to reconsider, or even change, their strategies. This is especially the case when working with a niche product. Thus, reflection is an important part of the learning process in strategic niche management. While nearly all of the start-ups interviewed stated that they had done some kind of reflection during the product development, few seemed to engage in reflection after the initial development phase. Respondent 11, however, explained that learning was important in his organisation, and that activities such as "peer to peer" learning were central and were part of the business model.

One (stand-out) example of reflection occurred from an unfortunate communication breakdown with a supplier by one of the start-ups. Respondent 5 explained that her restaurant had had a television campaign run about them, and afterwards one of the suppliers was very upset as they believed they were shown in a negative light. This lead to the supplier refusing to continue working with the start-up. After this, the start-up chose to change their strategy.

> *So now our new strategy is saying we fight together against food waste, we fight together with our suppliers. Because our suppliers find it as important as we do. So, that's our strategy now and I think it works fine like that.*

Instead of just accepting that they now had one less partner, this group decided to change their strategy, and to frame their cooperation with food retailers in a more positive light.

Again it is necessary to comment on the interconnectedness of the different SNM practices. In this instance, learning did not take place only within Respondent 5's restaurant, but occurred from interactions with their social networks. After a complication arose from miscommunications with an important supplier, the restaurant changed their strategy to be more focused on cooperation and co-designing towards ways to reduce the impact of food waste. They do not act as singular agents in the fight against food waste, but act collaboratively with others in their network.

While most of the respondents expressed engaging in some experimenting and testing practices, related not only to the development of their product but also their business model, very few engaged in actually reflecting and changing based on experiences they had. These findings will be further discussed in chapter IV.

3.1.4 Practice 4 - Management of values:

Interviewees were asked if there were any particular values, social or otherwise, that their company was founded upon, if these had changed since the beginning of the project, and if they believed these would change if their company were to grow.

The responses of the interviews were categorised in to two sections: the *type* of value that was important to the start-up, and the extent to which the group believed they would *change* if they were to scale-up in their activities.

Types of values

For the start-ups, the shared vision of their project was strongly tied to the values that were central to their company. Thus, each start-up stated having social and/or environmental values as important to their group.

Two groups stated that self-sustainability and profit were also important values. Respondent 1 explained that:

> *…It's just so important that they know that this isn't just a fancy idea without, as we say in German, hand and feet. It's got to be, they've got to be reassured that we really mean it and that we know what we're talking about. And that we're trying to do a good job economically, but also against food waste. And with a lot of heart. For people and for environment as well. Otherwise we can't convince anyone about the concept and about our store.*

Respondent 7 explained that it was an important value of her company that it have a social workplace (*sociaal werkplaatz*), so that she can employ people with disabilities. Respondent 10 stated that an important value to their company is that the supplies come from local farmers and retailers that they have relationships with. Respondent 5 stated transparency and fair payment as important values for her group.

Respondent 11 explained that learning was an important value to his project. While he did not reflect on organisational learning itself, he did mention that he promoted peer to peer learning for students and actors in his network, as he believed that education of his volunteers and others in his network was extremely important. He explained that:

> *We have apprentices, we have many young people, volunteers working in our shops from abroad and from here. We are very active in a very peer to peer learning, peer exchange learning.*

Respondent 11 further explained that creating a comfortable, social space within his shops and in his food surplus restaurant was an incredibly important value to him.

These values do not have a direct relationship to waste, but were reported as key values to their businesses and as central in their goals to fight waste.

Changing values with scaling-up

Only one of the interviewees (Respondent 10) stated that they believed that scaling-up or growth in their production/distribution would negatively impact their values or vision for their company. However, this was also the group that expressed that their supplies must be from local farmers with whom they have a relationship. So, in this instance, expansion does indeed present a direct challenge to their core values.

For other respondents, the opposite appeared to be true. Respondent 2 explained that it might even be easier to maintain values and reach their goals if they were to grow:

> *No, I think it would actually be even easier if we scale up, because due to economies of scale, we would be able to push the manufacturing price down, and we would be able to delegate more of the produce for the humanitarian aid for either free or a subsidized price. So, if anything, I think it would be even easier for us to meet our goals.*

Respondent 7 also expressed this. The respondent from this company explained that even though some work would need to be mechanised, she would still maintain a social workplace.

...if I were producing on a larger scale, that means more profit. And I would always still use that profit to have that social workplace. I would create a social workplace to create job opportunities for people that have Down's syndrome or mental disabilities

For these groups, growing was seen as a way to better maintain their social values as they saw growth as an opportunity to give more money back to their social causes. Respondent 7 further stated:

"I think as an entrepreneur nowadays, you owe the world a little bit"

One unexpected result from the discussion on the management of values is how interconnected these values are to the central, shared vision these start-ups have created. For these entrepreneurs, these values are not something separate from their vision, and thus cannot be compromised while scaling-up. It was also interesting to find that 10/11 start-ups interviewed did not believe that scaling-up would change these values, again, because they are so closely interconnected to their visions.

3.1.5 Management of future of product & company:

Interviewees were asked what potential future they envisioned for their company and product, and for the re-usage of food waste in general. Respondents 6, 9, and 10 expressed that they foresee that, in the long term, they will go out of business. Additionally, Respondent 11 explained that his group would be stopping operations on their restaurant in the coming year due to expenses. The remaining seven respondents expressed plans for future growth and new product development.

Interestingly, respondents 6, 9, and 10 each expressed that they believe they will no longer be in business in a few years stated the same reasoning for this. They all believed that, because of the attention the problem of food waste is receiving from the media and governments, greater action will be taken on a larger scale to address it. Thus, their business model will be no longer relevant or needed. Extinction of their companies was not seen as a failure, but rather as a success. They believed that if they were to go out of business, they will have achieved their goal of stopping food waste.

The other start-ups, however, detailed more concrete plans for their futures. Four of the groups interviewed stated they are planning to develop new products to increase their impact, and six

of the respondents are planning to increase their sales by expanding their markets, or establishing stores in new locations.

The practice of creating shared visions and social networking were present in the strategies of the respondents' start-ups. Specifically, consulting and communication of mutual benefit were present in the practice of creating shared visions, and social networks were built with many stakeholders to ensure support of their products. The practice of these will likely help these start-ups as they work towards scaling-up their activities to further achieve their visions. However, as learning is seemingly less practiced right now, this will need to become a more central focus for the start-ups.

3.2 Barriers:

In addition to understanding what strategies start-ups use to remarket food waste, a secondary goal was to identify barriers these start-ups face. This is meant to elucidate if there are any ways that governments or other stakeholders can provide assistance to help start-ups interested in addressing food waste in overcoming or managing barriers, as well as to inform other potential entrepreneurs interested in engaging with this topic. Table (3) provides an overview of these barriers, examples of them, and the number of respondents who reported encountering them.

Barrier:	Example(s):	# of respondents encountering this:
Logistics	Getting inputs, coordinating deliveries	7
Safety	Health department regulations, consumer safety concerns	3
Legal & Bureaucratic	Non-profit status, insurance	3
Material constraints	Recyclability of packaging	2
Experience	Lack of knowledge of industry	2

Resource constraints	Lack of money, lack of human resources	4

Table 3: Barriers reported by respondents

Several barriers were identified. Seven respondents reported the logistical issues of collecting inputs presented a major challenge to the functioning of their business. For many of these groups, they must collect food waste from suppliers themselves, which requires a lot of coordination, time, and energy.

Four of the respondents expressed having difficulty finding supplies, or difficulty in relationships with suppliers. Respondent 8 reflected that, even though food waste is a well-known and visible problem *"…it's not like you just walk down the road and then you find 10 tons of apples. It's actually a lot harder finding where this food waste is, and in a state that you can actually use it"*. Respondents 5 and 8 expressed difficulty in attaining supplies because retailers did not want to admit that they were throwing out food. *"A lot of supermarkets they don't want people to know that they are throwing away that much. So it's not that easy to find suppliers",* said respondent 5.

Respondent 6, however, reflected that this became easier as the topic of food waste received more attention:

> *But to begin with, we just had a struggle to figure out how to run a restaurant, and how to get the surplus food. Because nobody would admit that they had surplus food in the beginning. And that was in 2012, and the whole food waste debate was just beginning to raise back then. And we had a really hard time making these huge chains admit that they had anything that was discarded every day.*

Concerns about the safety of the products made from food waste were not mentioned often as a significant barrier, but three start-ups did report that they had received questions regarding this. Respondent 2 explained that *"…We often get the question of whether it's really safe and so-on, but in our pilot we have run safety tests. So we have actual arguments to go on, and since we have studied Food Science, we know how to establish the safety criteria"***.** Respondent 4 ran in to challenges with insurance regarding his company, and was asked to write a statement of declaration taking responsibility for any illnesses. Perhaps the biggest challenge regarding safety came through an interaction with the health department. Respondent 6 explained how her restaurant received extra attention from the health department:

…they were really focused on everything we did and they came by all the time, and told us to change all the tiles in the kitchen because some of them were broken. Even though the place was totally clean, so they were focused on so many small details that wouldn't have been the same in a normal kitchen. We could feel that this, maybe a bit of mistrust, because when people hear the word surplus food, they think old food and that's not something for a person who works in the food hygiene. So we had to do a whole lot of rebuilding and cleaning the kitchen, even though it had been a restaurant before us that didn't have problems with that.

Luckily, Respondent 6 additionally reported that they have received top scores in health and sanitation four times in a row, and now have good relations with the health department in their community.

Four of the start-ups reported experiencing bureaucratic and legal barriers. Respondent 5's restaurant wanted to become a non-profit organisation, but ran in to obstacles in pursuing this as their group was engaging in economic activities related to running a restaurant. *"People didn't understand what we wanted to do, and how it can be not-for-profit but also a restaurant. It needed many explanations"* she explained. Respondent 3, whose food waste-fighting platform is founded on a close partnership with a national supermarket, ran in to bureaucratic issues. "*Many people thought it was a great idea, but thought it wouldn't go through the hierarchy, or the bureaucracy of a big company",* she reported.

Respondent 4 reported that a festival venue would not allow his company to advertise where their product came from:

"We thought that that was our unique selling point. They knew it and understood it and had no problem with it, but they thought it was illegal!"

He reports that now, however, that as food waste has become a more visible topic, festivals actually ask to advertise his company in their pamphlets.

Lack of knowledge and resources also presented major barriers to these start-ups. Respondent 8 explained that when beginning their company, she and her co-founder experienced difficulties given their lack of experience with food and the industry:

What do you even google? We were looking for machines to make our snacks, we didn't know what to google because we had no experience. So it's just that kind of like complete blindness to what you're supposed to be doing or how things work in the food industry, both in terms of the production side but also the retail side.

Only four of the respondents directly expressed that lack of financial resources were a serious barrier, but Respondent 10 did express that *"producing on a smaller scale results in a higher price"* which can be straining for a start-up. Three additional respondents expressed that limited

human resources presented barriers. Respondent 9 even expressed that this was the only real barrier he had encountered, as the platform of his group was run on the help from volunteers. Respondent 5 expressed that her start-up was often stretched thin, as most of the participants were engaged in the project part-time, and had second jobs.

Respondent 11 explained that working with surplus had created some financial burden as it *"is cheaper to throw away food".* He further explained that one way of combatting this is by raising the price of the food they sell at their shops and at the surplus restaurant. This presents a barrier, as some consumers are not willing to pay this higher price. However, Respondent 11 explained that this was managed to an extent through communication with his social network:

> *We had a round table about prices, and people said that when you know each other, when you talk to the shop staff, to the farmers, the logistics, they really see the value behind [the product]. You come in to a relationship, and then the price becomes a new quality, a new value*

This presents another example of how, when barriers arise, social networks can be used to overcome them.

The final barrier that was often expressed was constraint of the materials in which these start-ups worked with. However, none of the respondents stated that the food waste itself was a material constraint. Other aspects of their product seemed to be seen as more constraining. Respondents 7 and 8 did say that packaging had been an issue, with Respondent 7 reporting that her packaging was not recyclable. She found personal issue with this, *"because a lot of people are attracted to that [the recyclable] side of it."*

The start-ups interviewed have already done a lot of work in overcoming these barriers, but future aid from governments and other external stakeholders could help the management of these obstacles even easier, especially in regards to funding and creating spaces for entrepreneurs to develop and expand their ideas.

Ch.4 Discussion:

Having presented the results from the interviews, this discussion section serves as a place to reflect on them, relate them back to literature on SNM, and to understand the importance these practices have on the future of the niche of food surplus entrepreneurship.

4.1 Practice 1 - Shared visions:

While most of the respondents reported instances in which they communicated the mutual benefit of their project to their stakeholders, or the potential replicability of the projects, only three (Respondents 2, 3 and 11) directly reported consulting with external stakeholders whilst developing the vision for their initiatives. Not engaging in such consulting activities could have been why some groups experienced difficulties in working with suppliers to get inputs for their products. This is reported in other studies on SNM, where lack of consultation or inclusion of external stakeholders in the visioning phases of the project led to their inability to be accepted by important stakeholders (Hoogma et al., 2002).

However, this lack of consultation when creating a shared vision could be a result of the unique nature of working with food surplus. As many of the respondents reported, the problems of food waste are now well-known, having received media attention and are inspiring governmental action. Even the European Union is releasing plans and funds to tackle the problem. Thus, consulting with external actors might not be deemed necessary by these entrepreneurs, as the vision of all of these start-ups is simply to put an end to wasting food. Because this is an important cause to many in the public and in private organisations, entrepreneurs may assume that commitment is a given, and thus consultation is not necessary.

While consultation in creating a shared vision was not present in most of the cases, consultation with stakeholders and experimentation on and testing of the products themselves often was. As the products these groups created were key to achieving their visions of ending food waste, it is thus more important for them to consult with stakeholders on the acceptability of these. Consulting on the acceptability of the vision itself may be considered less important.

This contrasts with many other cases of SNM, where creating a shared vision for a sustainable future truly is necessary. With sustainable energy transitions, for example, stakeholders may disagree on what a sustainable energy future looks like. Thus, it is important to engage and consult with many actors outside the niche to ascertain what future vision is required to gain

support of stakeholders before moving forward with developing and scaling-up a particular technology or practice. When it comes to the desired future of ending food waste, however, most stakeholders will want the same thing.

Nearly every respondent discussed in depth how they were able to communicate the mutual benefit of their product to stakeholders, thus receiving support in various ways. This finding, however, directly conflicts with some studies conducted on social entrepreneurship through a SNM lens.

For example, in their study on social entrepreneurship in the Netherlands, Witkamp et al., (2011) found that social entrepreneurs often had difficulty securing support in the form of institutional capital from external stakeholders in part "because the social value created by these entrepreneurs cannot be capitalised upon by the investors and thus yield[s] no added incentive to invest" (Witkamp et al., 2011, 675). Given the amount of discussion of the commitment and support these start-ups received from various stakeholders, this does not appear to be the case in this study.

This is probably due to kinds of benefits these entrepreneurs communicated, and what kinds of benefits their products generate. Respondents explained that the benefit was not only financial, but also provided their partners and stakeholders with benefits such as good public relation stories, and convenience. Interestingly, reduced costs of disposal were also cited as a benefit that was communicated to the suppliers of the food surplus. This, while perhaps indirectly, is a financial benefit for the supplier. Still, in future studies, it may be important to consider indirect, non-financial benefits stakeholders receive when investing in social innovations. The creation of partnerships through social network building seems to be a key practice in communicating these non-financial mutual benefits.

In reflecting on the practice of creating shared visions, it is also important to examine the interconnectedness between creating awareness and communicating mutual benefit. By communicating the benefits of their products to potential stakeholders, these start-ups were additionally creating awareness within these stakeholders. While the vision of creating awareness might be aimed mostly towards consumers, by creating mutually beneficial partnerships that combat food waste, other stakeholders and industrial actors are informed of the problem and may perhaps be motivated to respond to it themselves through activities within their own industries. While this would not necessarily entail providing financial support to

entrepreneurs currently engaged in food waste fighting activities, it would indicate change on the broader regime level.

Some preliminary propositions to consider for further scaling-up and expansion of this food waste re-marketization niche can be made. Creating shared visions is an important practice in any niche, as it sets clear goals and steps in creating regime change, and in inspiring commitment from external stakeholders. To further the growth of the niche, both in its market and regime changing potential, further consultation with external stakeholders in the design of both products and business model is encouraged. By consulting with external stakeholders on the creation of these visions, entrepreneurs can get "expert advice", and potentially avoid mistakes made by others before them.

Additionally, the communication of mutual benefits to external stakeholders as a support-attracting activity should continue to be a focus for entrepreneurs in this niche. While many respondents explained they had been able to attract support by detailing the non-financial benefits of their business, as they scale-up it will likely be necessary to also assign attention to promoting the financial benefits of their business and product.

4.2 Practice 2 - Social Networking:

Interactions with stakeholders, suppliers, and users were the most heavily discussed topics in all interviews. SNM literature explains that promoting relationships and partnerships with external stakeholders is a key aspect of the strategy and is necessary for success in scaling-up activities (Hoogma et al., 2002; Schot & Geels, 2008).

7/10 respondents reported including users in either the development of their products or in some other capacity, such as development of the business model and strategy. Hegger et al., (2007) state that a common downfall of SNM is the lack of inclusion of users, especially in more technical products. As the products these food surplus entrepreneurs market are not technical, user involvement is arguably less necessary. The involvement of users in the design of their product may contribute to future success of their products.

In addition to inclusion in the actual product design, some respondents actually included their customers in the design of the business model and strategy itself. This goes beyond generic interactions of product development, as it requires closer relationships and consultation with

the customers. This inclusion of customers in these processes could aid the group as they grow and scale their activities, as it allows users to be engaged in actually planning that process.

Ex-post analyses of failed niches show that an inability to include external actors in a direct way in both the development and marketization of the product was a major factor in their failure (Hoogma, 2002; Raven, 2005). Schot & Geels (2008) explain that "…Failed niche developments could often be related to either minimal involvement of outsiders in the experiment and a lack of second-order learning, or to minimal involvement of regime actors which resulted in a lack of resources and institutional embeddedness" (pg.541). Respondents from the start-ups interviewed, however, worked intensely to include external actors. This work could benefit them in the future.

It is arguable that the creation of such close partnerships within these networks is even more important for entrepreneurs working with food waste. This is especially apparent when building partnerships with suppliers. The quality, quantity, and consistent supply of the inputs is never secure, and can sometimes be difficult to obtain, as was expressed by several respondents. Thus, the only way to assure supply of materials and food needed to create and remarket their products is to create strong partnerships with suppliers and other stakeholders. Food surplus entrepreneurs must devote a large quantity of their time to this kind of network building in order to ensure this supply. These partnerships, while created for transactional purposes (i.e.: obtaining food surplus to create a product), must involve more than just a formal exchange of resources. They must be founded on trust, and should be community building. The nature of this can be highlighted in the example from Respondent 5, who lost a supplier after an advertisement was run about their restaurant that painted their suppliers in a negative light. The trust and respect built between Respondent 5's restaurant and their supplier was tarnished, and the supplier felt they were no longer part of the community that the respondent wanted to create. Now, the restaurant builds these transactional partnerships based on the idea that they are fighting food waste together, as a community.

Additionally, these "beyond transaction" partnerships are highlighted by Respondent 4. He explained that before creating his product, he had already created relationships with suppliers during a research project. When he decided to get involved in reducing food waste through creating juices, he turned to these suppliers for initial support. Because they knew him and had built a relationship with him, they were willing to provide him support, such as giving him inputs for his juices for free.

Because of the instability of working with food surplus, these entrepreneurs need to spend more time creating relationships with their suppliers. It cannot be a simple exchange of resources, but must be community building.

It is also necessary to reflect on the interconnectedness of other SNM practices with the practice of creating social networks. Not only is the creation of these networks important in managing barriers and recognising opportunities, but it is also deeply intertwined with creating shared visions and learning. This interconnection was observed from interviews with the start-ups. First, in creating a shared vision, the inclusion of the social network is necessary. Many of the respondents reported communicating the mutual benefit to their stakeholders as an important process of creating their shared vision. Learning is also closely intertwined with creating social networks. Learning did not occur independently for the respondents, but was the outcome of interactions, and sometimes even conflict, with stakeholders in their social networks.

In the future development and scaling up of the niche of re-marketing food surplus and waste, it will be important for these entrepreneurs to continue to build and strengthen the social networks they have created. Institutions, such as the Food Surplus Entrepreneur Network, exist to enable entrepreneurs to meet other entrepreneurs in the field, as well as provide aid and help in how to develop social networks. Working with institutions like this could provide help for the groups in scaling-up their practices and building stronger social networks. These kinds of institutions also provide the added benefit of connecting entrepreneurs with others who have more experience in this kind of work. This could aid them not only in building competencies necessary to run a successful start-up, but also in helping them avoid problems others have faced. This kind of learning within the social networks will be incredibly important as the niche of re-marketing food waste continues to scale-up and grow.

4.3 Practice 3 - Learning:

Five of the 11 interviewed start-ups directly expressed instances of engaging in learning activities related to reflection and experimenting. This number seems small, as learning is considered perhaps the most important part of SNM, and in entrepreneurship in general.

There are several potential explanations for why learning was the least reported practice that was used. Firstly, learning is a difficult practice to define and measure. Politis (2005) explains that learning behaviours in entrepreneurs have historically been difficult to measure. This is partially because there is a lack of academic definition of what constitutes (entrepreneurial)

learning, and guidelines to measure it (Politis, 2005). For example, Politis presents two forms of learning from Kolb (1984), acquisition (grasping) and transformation, where the first is just simply "experiencing", and the other is considering knowledge that is gained from experimentation (Politis, 2005, pg.401). Knowledge acquired from "experience", versus knowledge acquired from "experimentation" can be difficult to distinguish, and even more difficult to assess. Thus, one potential reason learning was reported infrequently could be due to these methodological and semantic difficulties in measuring learning.

Additionally, Harrison & Leitch (2005) explain that there is a difference between experiential learning that takes place during the entrepreneurial process (in this case, the creating and marketing of a food waste product), and the original "stock" experience that entrepreneurs take with them when engaging in these processes (pg.364). In this study, learning was only assessed within the context of the projects that the start-ups are currently working on. Respondents were only asked to reflect on their experiences with the project, but not asked specifically about their background or other entrepreneurial experiences. These respondents may have already developed competencies relevant to entrepreneurial activities, which might have been further strengthened from their involvement in the project they are currently working on. Instances of learning and competence building from previous experiences or projects and the impact they have on the current projects were not measured and cannot be assessed.

Another potential reason that learning is less frequently practiced could be simply due to the age of these start-ups. The average age of the start-ups studied was 2.5 years. In the initial phases of product development, many of the respondents reported focusing more on logistical issues, or the framing of their business vision and its goals. Learning is, of course, continuous, but it takes time to build knowledge and experience (Politis, 2005). Thus, in the short time these start-ups have been operating, competencies may not be fully developed, and chances for reflective learning might not yet have occurred.

Regardless of the potential reasons for this, less focus on learning, specifically second-order or double-loop learning, can negatively impact the future of the niche. Ex-post studies on failed niches have identified a lack of engagement in second-order learning as a major factor in their failure (Hoogma, 2002; Raven, 2005). Thus, for the future success and development of this niche, learning will need to take a more prominent role in these strategic vision of these start-ups.

One way for entrepreneurs re-marketing food waste to promote future competence building and double-loop learning again comes through interaction with their social networks. By interacting with other experts and actors in the field of food surplus entrepreneurship, they may be able to further build competencies and learn from the mistakes others before them have faced. Additionally, start-up incubators and institutions could hold workshops and trainings to help innovators develop important competencies.

As these start-ups scale-up their activities, learning, as well as institutionalising what is learned, is necessary. Thus, in the future, this practice should become a focus of the strategy of these start-ups.

4.4 Practice 4 - Management of Values:

Witkamp et al., (2011) posits that social innovations often have difficulty scaling-up and creating regime change due to the importance placed on the (social) values that they are based on. These trends, however, were not reported by the respondents of this study. Only one of the respondents claimed that they believed scaling-up their activities would change their values. Others believed that scaling-up would actually strengthen these, and aid in achieving goals.

The reason behind this could be because that, for many of the respondents, the values of their company are so deeply tied to their goal to create an impact on society, and end food waste. To achieve this goal and increase their impact, some scaling up of their activities beyond the start-up, or niche, phase is required.

One respondent did indicate that scaling-up would impact their values. In his study on organic and local agricultural niches, Smith (2006) found that niche actors were forced to give up the "local" value as they scaled-up practices. This sentiment was mirrored by respondent 10 who believed growth would impact their values, as this start-up also held localness as a value. Thus, the type of social values these start-ups have seems to be a greater determinant of their difficulty or unwillingness to scale-up. Simply having social values as a company is, however, not a deterrent to scaling-up practices.

4.5 The interconnectedness of SNM practices:

One unexpected finding from this research is how deeply interconnected the practices of SNM appear to be for actors working with food surplus. While some preliminary discussion has already been made on this, further elaboration of this interconnectedness if made here.

From interview responses, it was found that the creation of a strong social network seemed to be central, and lead to the practice of SNM practices. Instances of more reflective, double-loop learning seemed to occur as a result of interactions with stakeholders in their social network, and through the creation and negotiation of partnerships within these networks. Such reflective learning could not take place without first creating these networks.

Social networking was also tied to the management of values for some groups. Respondent's 10 and 8 both used social networks to maintain and manage values important to their start-ups. For Respondent 10, managing their "localness" value was maintained by partnering exclusively with local farmers, and for Respondent 8, their desire to address food security was managed by partnering with social non-profit organisations.

Creating shared visions and social networking were also closely interrelated. In consulting with external stakeholders to create a shared vision, or when communicating mutual benefits of this vision, interactions with a social network are necessary. Development of social networks can also aid in bringing in stakeholders to engage in the development of this vision.

As these innovations grow and scale-up, the interconnectedness of the SNM practices used to do this will become more important. The interconnection of the practices indicates that one cannot be performed without the others. In order to create a shared vision, or to learn, a strong social network must also be present. This also indicates that the ill-performance of one of the practices directly impacts the performance of the others, which could influence ability for these innovations to scale-up and create meaningful regime change. Thus, it is important for niche actors to not only focus on the development and use of one practice, but of all of them.

4.6 The Future of the Food Waste Remarketing Niche:

As explained in the literature review, Hoogma et al., (2002) present four potential futures for niches based on their use of SNM practices. Those are:

1) The niche remains purely technological, mostly operating through experimentation. New applications for the product may be found and then replicated. Through this

continued experimentation, the niche may eventually develop enough to expand and upscale to the market.

2) The niche enters the market. Experiments on the application of the niche are "not necessary any longer, but users start to recognize the advantages of the novel technology and suppliers are willing to invest in production on a small scale" (Hoogma et al., 2002, pg.31).
3) The market niche expands, developing in new directions "leading to the emergence of new market niches" (Hoogma et al., 2002, pg.31).
4) The niche goes extinct. The niche fails to attract further support or funding. Some investment may remain, but little progress in development is made. However, learning from the failed niche experiment may be transferred to the development of another niche.

Based on their implementation of social networking and vision creation strategies, the seven respondents who detailed further plans for development and growth will likely continue toward the third outcome. For many of these seven start-ups, their products are already on the market, but continued experimentation on them and the business models behind them is possible. This is in part due to attention the issue of food waste has garnered from governments and other relevant stakeholders. Thus, regime shifts are already occurring, opening up opportunities for these innovations to replace current regime practices. Additionally, growth and scaling of this niche is also expected to occur due to the example that entrepreneurs in the niche have already set. This was especially seen in the restaurants interviewed, as respondent 6's restaurant had inspired two of the other respondents.

It is, however, necessary to reflect on the respondents who expressed an envisioned future in which they believe their activities would no longer be relevant. Their extinction does not indicate a failure in niche management, nor the absence of a regime change. It could actually indicate the opposite. The reason that these social innovators are engaging in creating products and processes to reduce food waste is because food waste is a problem. Their goal is to end this problem, and ending this is seen as the only way towards success. These sentiments represent the shortcoming of applying SNM to social innovations, particularly those related to topics such as food waste. SNM currently does not explicitly account for the possibility that innovators might not see the use of their product or process anymore after a regime change has taken place, especially if their vision of regime change is not technological change, but social change, such as the re-valuation of food by individuals.

Ch.5 Concluding Remarks:

This study set out to understand how entrepreneurs remarket food waste, what strategies they use, what barriers they face, and how these strategies could impact the future of the food waste re-marketization niche as the scale-up and work towards creating regime change. It was found that entrepreneurs and their start-ups that work with food waste or surplus engage in practices detailed in SNM. Particularly, much of their practices are aimed at developing social networks, and the creation of these networks is paramount in framing their strategies. This is likely because, given the nature of working with food waste and the uncertainties it creates, creating extensive and secure social networks helps to overcome barriers. Learning was less practiced, but as 7 of the respondents detailed plans to scale-up their practices, there is time yet for them to engage in learning practices.

The practices of SNM were found to be highly interconnected to one another, meaning that the practice of one often involved the practice of another. This also means that if one practice is not strongly performed, this impacts the performance of the others. It was also found that the respondents do not believe that the values central to their innovations would be lost by scaling-up their practices, again due to the close connecting between these values and the shared visions they have created. However, this interconnectedness holds importance for the future of the innovations and their start-ups. As these innovations grow and mature, all practices will need to be performed in concert with one another, and the values and visions central to them will need to continue to be carefully managed.

While many of the start-ups did use practices related to SNM, it is possible that SNM is not the most suitable theory for the development of the valorisation of food waste niche. Studies done on SNM until this point mainly point to the replacement of one technology or practice with another. Current literature on SNM does not account for instances in which the end goal of the innovation is not to just replace one unsustainable practice with another, but to change how society views and performs that practice entirely. Entrepreneurs working with food waste do not envision a future in which ugly, discarded or surplus foods are used as alternative products, but instead envision a future in which all food is viewed as equal. Additionally, the quantifying "scaling-up" is difficult to do, and can mean different things to different actors based on their experiences. Thus, what might be considered successful scaling-up to one start-up, might not be the same vision of success held by another.

5.1 Reflections & recommendations for future research:

This study provides an extensive overview of a group of entrepreneurs that have not yet been studied in SNM literature, and shines light on the practices that they use and the barriers they face. However, SNM is not necessarily the most appropriate theory to apply to this study. Practices identified in SNM literature are all fairly basic. They are practices that nearly all businesses and organisations participate in to some extent. Thus, while these respondents all reported engaging in practices related to SNM, this does not necessarily illuminate the practices that are unique to food surplus entrepreneurship. Future research on food surplus entrepreneurs should apply different management theories, to further understand the practices these actors use.

Additionally, as stated already, SNM theory currently does not address that some entrepreneurs or niche innovators may not see the adoption of their products by the regime as the end goal, but instead see it as an overhaul of the current regime practices. This is because these entrepreneurs work mainly with social innovations. Thus, in the future it would be necessary to include social innovations in SNM studies.

Finally, there are some methodological considerations that need to be made on this study in particular. Due to geographic and time constraints, the sample size of this study is quite small. This is also due to the small number of start-ups that actually met the criteria of the study. Additionally, while more start-ups were contacted for interviews, some chose not to participate due to the high number of requests they receive for interviews. In future studies, it might be necessary to expand the criteria for the study as to allow for more data to be collected.

Measuring learning as a practice in SNM also proved to be a difficulty of this study. Learning is a notoriously complex practice to measure. To improve this, a study that specifically focuses on learning practices that food surplus entrepreneurs engage in could be undertaken.

The products created by these start-ups present opportunities for regime change in how society views and handles food waste and surplus. Reflections in this study on the future of these start-ups and their products are only elementary. Future research, such as follow up studies on prevalence and success of this niche in the coming years or research on the learning practices of these entrepreneurs, should be done to continue to monitor their progress and to understand how they can create change in our food system.

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Appendix I: Operationalisation of SNM Practices

1) **Creating a shared vision** is defined as the deliberate process of actors within a niche to map a vision or goal of what they expect from their activities, and how they plan to achieve this (Schot & Geels, 2008). Weber et al. (1999) explains this pratice as the "definition of goals to be achieved in the experiment" (fig.xx, Appendix II). Some key indications of this taking place are derived from the literature and are as follows:
    a. The defined goal of the product is realistic enough to be achieved (Kemp et al., 1998).
    b. Goal is substantiated by continuous and ongoing projects (Schot & Geels, 2008).
    c. Promises of the product are made clear through the definition of the goal.
    d. The goal is "broad enough to enable learning and unexpected results" (Weber et al., 1999, pg.80)
    e. The goal is flexible, and is open to change during product development and launch given new information received (Hoogma et al., 2002).
    f. Goal allows for application of the product outside of its original development contexts (Smith, 2006).
    g. Goal is important and realistic enough to inspire commitment or partnership from external stakeholders.
    h. The goal was conceptualised with external stakeholders (Kemp et al., 1998; Hoogma et al., 2002).

2) **Building social networks** is the action of engaging with actors external to the niche itself. Weber et al, (1999) defines the building of social networks as the "building adequate support networks" and "user involvement in the set-up phase" (figxx). Examples of activities that start-ups may engage in that are classified as this are:
    a. Involvement of experienced actors in field
        i. Start-up employees are multi-disciplinary and diverse. (Hegger et al., 2007)
        ii. Start-up has a "dynamic spokesperson" (Weber et al., 1999, pg.80)
        iii. Cooperation is done and partnerships are made with governments and regime actors (Schot & Geels, 2008).

b. Social networks are used to manage potential barriers to development and marketization of the product.
    i. Partnerships are made with government actors to negotiate solutions to problems that hinder product development.
    ii. Partnerships are made with governments and regime actors to secure funding for start-up (Hoogma et al., 2002; Schot & Geels, 2008).
c. Users are involved in the design and implementation of the products.
    i. Users were consulted during the design phase of the product.
    ii. During implementation, experiments or demonstrations are done in which users can give feedback on their experiences with the product (Hegger et al., 2007).
    iii. Users are involved in the implementation of the product in to real world applications (Hegger et al., 2007).

3) **Double-loop learning** is defined as not only focusing on getting knowledge and facts, but also on changing "cognitive frames and assumptions" (Schot & Geels, 2008, pg.541). Grin and Van de Graaf (1996) identify failure to engage in double-loop learning as a common pitfall of many start-ups and niches. Activities that start-ups may engage in that are considered double-loop learning are defined here as:
    a. Intermediary goals to aid product development and marketization are defined.
        i. Demonstrations and experiments with the product are undertaken to gather information on the acceptability of the product by consumers (Hegger et al., 2007).
        ii. Goal of product is redefined based on the outcomes of the intermediary goals or demonstrations (Jamali, 2006).
    b. Management of the product is clearly documented and defined.
        i. Documentation of intermediary goals and experiments are used to monitor and reflect on user experiences with the product (Hoogma et al., 2002).
    c. Time for reflection on outcomes of demonstrations of the product is encouraged.

        i. Employees are encourage to reflect on the progress of meeting product goals, and to make suggestions on how it could be changed or improved (Schot & Geels, 2008).
    d. Barriers and opportunities for the product are actively recognised.
        i. Considerations are taken as to how to manage potential opposition to the product (Schot & Geels, 2008).

4) As social innovations are not well studied in SNM, the **value** aspects of these are not well defined. Still, Witkamp (2011) give some insight in to what constitutes the criteria of the niche. Values should be beliefs or visions upon which the niche and its product or process are founded upon. They should involve a reorganisation of human and consumer behaviour, and should be different enough from the values held by the existing regime, but not so radical as to hinder their adoption. Examples of values could include:
    a. The focus of the innovation is not solely on profit maximisation.
    b. The product or process innovation created by the niche actors aims at solving a societal or environmental problem.

Appendix II: Interview Schedule

Interview Protocol Project: Practices used by start-ups to remarket food waste

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

Position of interviewee (functions/tasks):

Questions:

1) ***Tell me a bit about why you decided to create this product. Did you have a specific goal or intention in mind for its impacts when creating it?***
    a. Follow up: *How do you go about trying to accomplish this goal or vision?*
    b. Follow up: *Where did the inspiration for this product come from, and how/where did you develop/get the resources and people to create it?*

2) ***Who has been involved in developing your product? What are their roles and contributions?***
    a. Follow up: *How has this involvement impacted your product, company?*

3) ***What kind of barriers or opportunities have you experienced when developing or marketing your product?***
    a. Follow up: *How did you learn about these, and how do you manage them?*

4) ***Let's talk again about the goal of your product. Are there (social) values that are important to your company and its goals? Have these changed as your product has developed?***
    a. Follow up: *Do you think these would be changed if your product were to become more widely available, or produced at a larger scale?*

5) ***What kind of future do you envision for your product? Your company? Of food waste re-usage in general?***
    a. Follow up: *What would have to happen for this to become a reality? Both from your company and from the external environment*

Appendix III: Interview Codes

Table 4: Codes created from data

Strategy 1		**Strategy 2**		**Strategy 3**	
Shared Visions		**Social Networking**		**Learning**	
Type	*Performance*	*Stakeholders & Suppliers*	*Community & Customers*	*Reflecting*	*Experimenting & Testing*
Sub-codes	**Sub-codes**	**Sub-codes**	**Sub-codes**	**Sub-codes**	**Sub-codes**
(Physical) Impact	Consultation (with stakeholders)	Commitment (to idea)	Support	Changing Strategies	
Awareness Building	Communicating Mutual Benefit	Support (with resources)	User Involvement		
	Replicabability	Partnerships	Relationships		

Values		**Future**		**Barriers**
Type	*Change with Growth*	*Growth*	*Product Development*	Logistics
Sub-codes	**Sub-codes**	**Sub-codes**	**Sub-codes**	Institutional & Legal Barriers
Environmental &Environment	Yes	Yes	Yes	Concerns about safety
Professional	No	No	No	Lack of experience/knowledge
Profit & Self-Sustainability				Lack of resources
				Relationships with/finding suppliers
				Material constraints