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Swedish University of Agricultural Sciences

Department of Economics

Waste not, want not

- Food waste practices in Swedish restaurants

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Summary

Food waste is a global issue with environmental, social, and economic consequences. With a growing population the topic of food waste and how to use our resources more efficiently is more important than ever. Currently there are various policies aimed at lowering food waste amounts both at an EU level down to a Swedish municipal level. This thesis focuses mainly on the EU Waste Framework Directive which is implemented even at a municipal level in Sweden. The problem of food waste is linked to practices, habits and cultural attitudes in developed nations. For this reason it is important to study these practices in order to accommodate change and tackle the food waste issue.

Many studies have focused on investigating the sources of food waste from households while very little is known about other outlets such as restaurants whose services contribute to the food waste amounts. Limited research can be found on prevention, sources, and practices regarding food waste in restaurants. By understanding the practices and what affects food waste, work can be done in order to lower the waste amounts. Social practice theory provides a framework to understand food waste management in restaurants by looking at the practices and what affects them while bringing the socio-technical structure and cultural context into consideration. Stakeholder theory, sustainability management, and the triple bottom line are concepts that influence and relate to social practice theory in various ways while they also provide perspectives to help analyze the elements of practice theory.

The aim of this research project is to investigate food waste practices in restaurants during a time of awareness and efforts to change and address the food waste issue. The qualitative project consists of four case study restaurants, two full service and two quick service, in Uppsala municipality. The primary empirical sources consist of semi-structured interviews and participatory observations within the case study restaurants. A review of the existing literature as well as a study of the company websites and selected social media accounts make up the secondary sources of empirical evidence in the study. The analysis of the empirical findings is done with the help of the conceptual framework and selected theories.

The results of the project consist of four main findings and indicate that the restaurant type affects the food waste practices due to their systems and organizational differences. Further, the restaurant type has a significant impact on the type of food waste produced in the restaurant. Customer plate waste was discovered to be one of the bigger sources of food waste in the full-service restaurants and the use of doggy bags would be a way to lower food waste amounts but a cultural resistance toward the use of doggy bags was discovered in the case study restaurants. Lastly, none of the EU or national policies and regulations aimed towards the minimization or prevention of food waste has been directed at the restaurants in this study. The municipality encourages the sorting of food waste but there are no observed efforts to help the prevention of food waste in the restaurants. Since the prevention of food waste is prioritized in the EU and national policies, this finding is of significance.

Sammanfattning

Matsvinn är ett globalt problem med miljömässiga, sociala och ekonomiska konsekvenser. Med en växande global population är ämnet matsvinn och hur vi ska använda jordens resurser mer effektivt mer aktuellt än någonsin. I dagsläget finns olika policys med målet att minska matsvinnet både på en EU nivå och på svensk kommunal nivå. Denna uppsats fokuserar främst på EUs avfallsdirektiv som implementeras på kommunal nivå. Problemet med matavfall är kopplat till praktiker, vanor och kulturella attityder i utvecklade länder. Av den anledningen är det viktigt att studera dessa praktiker för att kunna åstadkomma förändring och minska matsvinnet.

Många studier har fokuserat på orsakerna till matsvinn i hushåll medan lite kunskap finns kring andra källor till matsvinn såsom restauranger vars aktiviteter och tjänster bidrar till mängden matsvinn. Det finns begränsad forskning om förebyggande åtgärder, källor, och praktiker kopplat till matavfall i restauranger. Genom att skapa en förståelse för praktiker och vad som påverkar matsvinnet så kan arbete göras för att minska matsvinnet. Social practice theory skapar ett ramverk för att förstå hanteringen av matsvinn i restauranger genom att studera praktikerna och vad som påverkar dessa samtidigt som den tar hänsyn till social-tekniska infrastrukturer och kulturella kontexter. Stakeholder theory, sustainability management och triple bottom line är koncept som påverkar och relaterar till social practice theory på olika sätt samtidigt som de bidrar med perspektiv och hjälp för att kunna analysera elementen som social practice theory bygger på.

Målet med denna uppsats är att studera praktiker kopplade till matsvinn i restauranger i en tid av medvetenhet kring matsvinn och dess konsekvenser och en vilja att förändra praktiker kopplade till matsvinn för att kunna minska mängderna matsvinn. Studien är kvalitativ och består av 4 case studie restauranger, två snabbmats restauranger och 2 full service restauranger, i Uppsala kommun. De primära källorna består av semi-strukturerade intervjuer och observationer i restaurangerna. Sekundära källor består av en litteraturstudie av existerande litteratur samt restaurangernas egna websidor och utvalda sociala medier. Analysen av empirin är gjord med hjälp av ett ramverk och valda teorier.

Resultaten indikerar att typen av restaurang påverkar matsvinns praktiker på grund av restaurangtypernas olika system och organisatoriska skillnader. Restaurangtyp påverkar även vilken slags matsvinn som produceras i restaurangen. Tallrikssvinn var en av huvudkällorna till matsvinn i fullservice restaurangerna och användandet av doggy bags skulle kunna minska matsvinnet. Dock upptäcktes en kulturell resistans till användandet av doggy bags i case studie restaurangerna. Ingen av EUs eller de nationella policyer som ämnar att minska matsvinnet kunde iakttas i restaurangerna i denna studie. Kommunen uppmanar sorteringen av matavfall men ingen uppmaning eller ansträngning för att minska matsvinnet kunde observeras i restaurangerna. Eftersom förhindrandet av matsvinn är ett prioriterat mål inom EU och Sverige så är denna observation av betydelse.

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Abbreviated Terms

CEP	Circular Economy Package
EU	European Union
EWWR	European Week for Waste Reduction
EYAFW	2014 European Year Against Food Waste
FAO	Food and Agriculture Organization
FSR	Full service restaurants
NAE	National Agency for Education (Skolverket)
NBHBP	National Board of Housing, Building and Planning (Boverket)
NCM	Nordic Council of Ministers
NFA	National Food Agency (Livsmedelsverket)
QSR	Quick service restaurants
RREE	Roadmap to a Resource Efficient Europe
SaMMa	Food waste reduction action group (Samverkegruppen för minskat matavfall)
SBA	Swedish Board of Agriculture (Jordbruksverket)
SCB	Statistics Sweden (Statistiska Centralbyrån)
SDG	Sustainable Development Goals
SEPA	Swedish Environmental Protection Agency (Naturvårdsverket)
SFWRP	Swedish Food Waste Reduction Project 2013-2015 (Regeringsuppdrag för minskat matsvinn 2013-2015)
SLU	Swedish University of Agricultural Sciences (Sveriges lantbruksuniversitet)
SPT	Social practice theory
TBL	Triple bottom line
TPB	Theory of planned behaviour
WFD	Waste Framework Directive
WRAP	Waste and Resources Action Programme
UK	United Kingdom
USA	United States of America

1 Introduction

This chapter provides background information on the issue of food waste and presents the problem, the aim, research question, and an outline of the thesis.

1.1 Problem background

This section discusses the food waste issue at a global, European (EU), and Swedish national level.

1.1.1 Food waste – a global issue

Large amounts of food are being wasted globally approximating to about 1.3 billion tonnes annually equaling one third of the produced food (www, FAO, 1, 2016). According to the Food and Agriculture Organization (FAO) (2011, 5), the total per capita production of edible food intended for humans, from production to retailing in the EU and North America, is 900 kilograms per year, of which 280-300 kilograms ends up as waste. In comparison, these same per capita figures in sub-Saharan Africa and South/Southeast Asia are 120-170 kilograms of food loss per year while the production of edible food is 460 kilograms per year. In developing countries¹, food waste occurs primarily post-harvest and during processing due to poor agricultural storage, and processing practices while in developed countries most food waste occurs towards the end of the supply chain managed by retail stakeholders and consumers (FAO, 2011; Lundqvist *et al.*, 2008; Parfitt *et al.*, 2010). Food waste varies by stage along the supply chain and in both developing and developed countries food waste amounts to 40 percent (FAO, 2011, 5). There is a growing awareness about the complex issue of food waste and it is gaining global attention (Halloran *et al.*, 2014) as the effects of wasted food have social, economic, and environmental implications (Aschemann-Witzel *et al.*, 2015).

Before describing the social, economic and environmental problems caused by food waste, it is important to understand different terms related to the topic. According to the FAO (2011), food loss is the loss of food occurring at the beginning of the food chain where resources are used to produce food for human consumption. Food waste is referred to as the food loss due to humans throwing away edible food meant for human consumption and this wasting of food mostly occurs at the end of the food chain (*Ibid.*). For the purposes of this report, the term food waste will be used to refer to food losses and food waste along the entire food chain, unless otherwise stated.

It is also important to distinguish between different types of food waste. The two basic types of food waste are *unavoidable* and *avoidable*. *Unavoidable* food waste is food that is not commonly considered edible, such as peels, bones, coffee grounds, cores etc., and usually occurs during the preparation of food (Bernstad Saraiva Schott & Andersson, 2015). *Avoidable* food waste is the food that could have been eaten or was edible at some point but instead is discarded (*Ibid.*). This description includes products that were prepared but uneaten, food that is left to go bad, and any food that is disposed of in edible condition (*Ibid.*). A third seldom used category is *possibly avoidable* food waste which consists of foods such as potato peels or bread crusts, which are considered unavoidable food waste in one gastronomic culture but avoidable in another (*Ibid.*). Appendix 1 provides a table detailing different types of food waste. Some literature defines the different types of food waste as edible or non-edible/inedible (Engström & Carlsson-Kanyama,

¹ The term developing and developed country or nations is used throughout the paper instead of the more appropriate terms of emerging and developed economies as the majority of the articles use developing and developed.

2004; Garrone *et al.*, 2014; Halloran *et al.*, 2014). In this report the terms avoidable and unavoidable, synonymous with edible and non-edible, will be used.

Societal effects of food waste

Food waste exacerbates food security problems and avoidable food waste is worsened by habits, practices and cultural attitudes in developed nations. World population currently stands at 7 billion but is expected to increase to 9 billion by the year 2050 (Parfitt *et al.*, 2010, 3065). A major global challenge today is food security, ensuring that everybody worldwide has sufficient amounts of quality, nutritious food and this issue will continue to worsen with the continued population growth trend (Godfray *et al.*, 2010). Global food security is worsened by the high amounts of food wastage at the end of the food supply chain in developed nations (Garrone *et al.*, 2014). Today, food security is an issue also affecting developed nations and according to Eurostat, in 2015 an estimated 8.2 percent of the EU population experienced severe material deprivation, which includes insufficient protein in the diet (www, European Commission, 1, 2016). Garrone *et al.* (2014, 129) state that “surplus food management is increasingly acknowledged to be a lever for the mitigation of food insecurity, especially in developed countries.” The authors go on to say that the management of surplus food reduction is important for food security efforts and surplus food could be donated to those who need it. There is also the ethical and moral issue associated with developed nations wasting edible food while other nations go hungry (Aschemann-Witzel *et al.*, 2015; Schneider, 2013a). Food waste in developed countries is also linked to individual behaviour and cultural attitudes towards food (Godfray *et al.*, 2010). This creates a challenge when trying to address, minimize, and prevent food waste (Quested *et al.*, 2013).

Economic effects of food waste

Economic and financial resources are lost in the wastage of food and organizations could benefit financially by reducing or preventing food waste, according to the Waste and Resources Action Programme (**WRAP**), a British charity formed to create and support sustainable initiatives (WRAP, 2011a). Food waste causes reduced income for the producer, while the consumer spends more money on food (Lundqvist *et al.*, 2008). According to the FAO (2013, 55) the global economic cost of food wastage, including both food losses and food waste, in 2007 totaled approximately 750 billion USD². It is estimated that food waste cost the EU 143 billion euros in 2012 and a large portion of this is associated with avoidable food waste (Fusions, 2016, 5). A United Kingdom (**UK**) study on food waste in the hospitality sector found that the annual cost of food waste amounts to over £2.5 billion (including the labour cost to prepare, cook and serve wasted food as well as the costs of ingredients, energy, water, transport, administration, and waste management) (WRAP, 2013, 3).

Environmental effects of food waste

Food waste has detrimental effects on the environment and increases greenhouse gas emissions, water consumption, energy consumption, forest devastation and loss of biological diversity (Nordic Council of Ministers (**NCM**³), 2012). When landfilled, food waste creates methane, a potent greenhouse gas (Fusions, 2015). Agricultural production accounts for 20-22 percent of global greenhouse gas emissions (Hertwich & Peters, 2009, 6414; Lundqvist *et al.*, 2008, 26) and 92 percent of the global water footprint (Hoekstra & Mekonnen, 2012, 3233). The FAO (2013) states that agriculture accounts for deforestation mainly in developing nations. Between 1980 and 2000,

² Based on 2009 producer prices (FAO, 2013, 55).

³ NCM (2012) is a study done by the Nordic Council of Ministers which looks at the causes and preventative measures of avoidable food waste in the Swedish, Finnish, Norwegian, and Danish hospitality sector.

more than 55 percent of agricultural land came from deforested intact forests⁴ and 28 percent of the agricultural land came from disturbed forests⁵ (Gibbs *et al.*, 2010, 16733). The study also shows that agriculture is globally responsible for 66 percent of threats to species, which includes mammals, birds, and amphibians (FAO, 2013, 49). Deforestation and loss of biodiversity are linked to food waste at the food production phase and the negative biodiversity impacts are often found in crops and areas which also have the greatest amount of food wastage (FAO, 2013).

The growth of the agricultural sector as well as the growth of other industries, leads to greater competition for the earth's resources (Godfray *et al.*, 2010). The use of land and resources for agriculture is necessary, but much of the produced food is wasted. Wasted food creates an efficiency issue as it wastes resources in all steps along the supply chain that could have been used elsewhere. A solution to the problem of food security is to use resources more efficiently (*Ibid.*). According to the FAO (2013), the highest carbon footprint of food wastage occurs during the consumption stage, the last phase of the food supply chain. When edible food is discarded by consumers, it has used up resources all along the food supply chain.

1.1.2 Food waste in the EU

It is estimated that in 2012, the EU generated 88 million tonnes of food waste (Fusions, 2016, 4). Included in this figure is both avoidable and unavoidable food waste and it is calculated across the entire food supply chain – primary production, processing, wholesale and retail, food services, and household sectors. The largest contributor of food waste in the EU, according to the report, is the household sector at 53 percent or 47 million tonnes. The processing sector is the second largest contributor of food waste at 19 percent or 17 million tonnes. Food services, including restaurants, contribute 12 percent or 11 million tonnes to the overall food waste generation, 9 million tonnes or ten percent comes from primary production, and five percent or 5 million tonnes comes from wholesale and retail (*Ibid.*).

1.1.3 Food waste in Sweden

Across the supply chain, Sweden generated almost 1.3 million tonnes of food waste in 2014 (Naturvårdsverket, 2016, 5), but as stated previously, most of the food waste in developed countries occurs at the end of the supply chain at the retail and consumer levels (FAO, 2011; Lundqvist *et al.*, 2008; Parfitt *et al.*, 2010). At the retail and consumer levels in 2014, households produced the most food waste at 720 000 tonnes, which is a decline of 50 000 tonnes from 770 000 tonnes in 2012 (www, Naturvårdsverket, 1, n.d.). In comparison, restaurants generated 79 000 tonnes of food waste in 2012, but by 2014, that number dropped by 13 000 tonnes to 66 000 tonnes in 2014, of which 60 percent was avoidable. Food stores generated 45 000 tonnes of food waste in 2014 of which 70 percent was avoidable. This was a 15 000 tonne decline from 2012 when they generated 45 000 tonnes of food waste. Figure 1 illustrates the amounts and the comparisons of food waste generation at the end of supply chain in 2012 and 2014.

⁴ An intact forest is a natural forest (Gibbs *et al.*, 2010, 16733)

⁵ A disturbed forest is a fragmented forest “affected by long-fallow shifting cultivation, logging, and fuel wood collection (Gibbs *et al.*, 2010, 16733)



Figure 1: Volumes of food waste at end of supply chains in Sweden 2012 & 2014 (modified from [www, Naturvårdsverket, 1, n.d.](#)).

Of the three sectors, households generate the most food waste, but restaurants also produce a lot of food waste especially avoidable food waste at 39 600 tonnes (*Ibid.*). Much of the literature and focus on food waste is directed towards household food waste and very little research is found regarding food waste in restaurants, and for this reason, this thesis focuses on restaurants in Sweden. While the amount of food waste from restaurants is considerably lower than households, restaurants contribute to the overall problem of food waste in Sweden and deserve efforts to minimize and prevent food waste generation, especially for avoidable food waste.

1.1.4 Food waste in the Swedish hospitality and restaurant sector

In 2014 there were 23 829 for-profit restaurants in Sweden ([www, SCB, 1, 2016](#)). According to Statistics Sweden (**SCB**), restaurants employed 89 211 people and had a turn-over of 84 851 million SEK in 2014 (*Ibid.*). The number of restaurants, the amount of people employed in the restaurant sector, and turn-over has increased annually since 2012 (*Ibid.*). These numbers refer to restaurants that offer meal services to customers dining in the restaurant, ordering take-out or getting their food delivered home from the restaurant. It also includes cooked meals that are sold from driven vehicles such as food trucks ([www, SCB, 2, 2016](#)).

In Sweden 20 percent of all consumed food is eaten within the hospitality sector which equals 1 400 million portions (Naturvårdsverket, 2011, 26). Out of all the food served and consumed within the hospitality sector an estimated 20 percent is thrown away as food waste (Naturvårdsverket, 2011, 26; Engström & Carlsson-Kanyama, 2004, 206). The sources or causes of restaurant food waste are many and the main sources include plate waste from customers, poor planning, awareness, attitudes, and training (Engström & Carlsson-Kanyama, 2004; European Commission, 2010; FAO, 2011; WRAP, 2011a; NCM, 2012; Katajajuuri *et al.*, 2014; Silvennoinen *et al.*, 2015; Garrone *et al.*, 2014; Halloran *et al.*, 2014). A detailed account of the multiple sources of food waste is found in section 4.4.

1.1.5 Policies and initiatives affecting food waste in the EU and Sweden

There is no EU level legislation directly targeting food waste, rather waste management and safety legislation includes or impacts food waste (Halloran *et al.*, 2014; Fusions, 2015). Efforts to minimize or prevent food waste across the EU, as well as in Sweden, are many (Fusions, 2015). The main EU food waste initiative impacting Sweden is the Waste Framework Directive (**WFD**), but other important initiatives are The Roadmap to a Resource Efficient Europe (**RREE**), 2014

European Year Against Food Waste (EYAFW), Sustainable Development Goals (SDG), The Circular Economy Package (CEP), and Fusions. Descriptions and details of all of these five initiatives are found in appendix 2. While these initiatives impact Sweden, the WFD is mandated to apply to all EU member states and the results of it reach the Swedish federal and municipal level governments.

EU Waste Framework Directive

The WFD is designed to apply to all waste streams and demands that member states design and implement their own waste prevention and minimization goals in policy, legislation, plans, and programmes (www, European Commission, 3, 2016). The main priority of the WFD is to *prevent* waste being created in the first place, from there it provides a hierarchy for the best methods of waste disposal after it has been generated. The second priority is the *reusing* of waste materials. The third is material *recycling*, while the fourth is *recovery* or *energy recovery*. The last resort is *disposal* or *landfilling* of the waste. Figure 2 illustrates the waste prevention and minimization hierarchy and priorities of the WFD.



Figure 2: WFD Hierarchy (Directive 2008/98/EC) (www, European Commission, 3, 2016).

The WFD is to be used in application to all waste and applies to biodegradable waste management. Food waste is included in the description of biodegradable waste, which according to the WFD is the “garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants” (www, European Commission, 4, 2016).

Waste Framework Directive in Sweden

In Sweden the Swedish Environmental Protection Agency (SEPA) is responsible for creating a waste plan to fulfill the EU mandated WFD and they are required to review and update the plan every six years (SEPA, 2012b). The program includes goals, actions and indicators that measure the progress of lessening food waste amounts and dangerous substances along with a description of already taken waste management measures (*Ibid.*). The municipalities are responsible for designing their own waste plan according to the WFD (Avfall Sverige, 2014). The first main goal for the minimization of food waste in Sweden is to lower amounts by 20 percent by year 2020 in comparison to the 2010 food waste levels (SEPA, 2013). The current waste plan covers the period 2012 to 2017 and focuses on resource efficiency and prioritizes prevention of waste (SEPA, 2012b). Amongst other goals, it strives to attain resource efficiency in the food chain by reducing food waste and recycling of plant nutrients and energy from food waste (*Ibid.*). According to the plan report, Sweden does a good job in waste management, but “good needs to become better within many areas” (*Ibid.*, 8).

The second main SEPA food waste goal is to have 50 percent of the food waste from households, food stores, and restaurants *biologically treated* by year 2018 (*Ibid.*, 32). This goal does not prevent food waste generation, but rather fulfills the fourth priority, which is energy recovery, of the WFD hierarchy. Biological treatment is an alternative to *incineration*, which is also considered energy recovery, or the landfilling of food waste. It includes both *compost* as well as *anaerobic digestion* which is a process in which microorganisms break down biological material, in the absence of oxygen, to produce biogas, compost, and fertilizer (www, American Biogas Council, 1, n.d.). Regarding food waste sorting and collection, SEPA representative, Christina Jonsson (www, Sverige Radio, 1, 2016) states, “Everybody needs to improve not only households, but also stores, school kitchens, restaurants (...) .”

1.2 Problem

The majority of the food waste management initiatives focus on the prevention of food waste. One of the reasons for this is that it is the most sustainable solution to the food waste problem (www, European Commission, 3, 2016). Lessening food waste reduces resource consumption across the entire food supply chain and despite the Swedish biological treatment goal, there are bigger benefits in the prevention of avoidable food waste (SEPA, 2012b). According to several studies, the hospitality sector including restaurants, has an opportunity to reduce and prevent food waste (WRAP, 2011a; Parfitt *et al.*, 2010). Financial gains will be realized by preventing avoidable food waste (WRAP, 2011a), while social and environmental issues from an ethical, moral and practical stand point will also be improved (Aschemann-Witzel *et al.*, 2015; Garrone *et al.*, 2014; NCM, 2012). The encouragement of the use of anaerobic digestion or biological treatment could act as a potential disincentive for the prevention of food waste (Fusions, 2015). According to SEPA (2012b, 41), biogas from food waste is estimated to compensate for only 10 percent of the impact on climate caused by production of food and it is 10 times more efficient to prevent food from becoming waste than to use food waste in biogas production (Livsmedelsverket, 2016). On the other hand, turning food waste into a resource is part of ‘closing the loop’ in circular economy systems that aim to reduce the loss of resources, limit the amount sent to landfills, and create incentives for behavioural change (Fusions, 2015).

Food waste amounts declined from 2012 to 2014 (www, Naturvårdsverket, 1, n.d.), but the problem, of especially avoidable food waste, still exists (NCM, 2012). While households produce the highest amount in Sweden, restaurants produce a significant amount which could be brought down to help lessen the problems and risks associated with food waste (*Ibid.*). Minimal research is found regarding food waste in restaurants. SEPA (2012a, 4) states that the prevention and minimization of food waste is vital “if we are to achieve Sweden’s environmental objectives.” Even though many efforts to address food waste have been made at the EU, Swedish national, municipal and individual restaurant levels, no academic research is found on the practices within restaurants in Sweden and the issue of avoidable food waste continues to persist (NCM, 2012). According to Godfray *et al.* (2010, 816), “Reducing developed-country food waste is particularly challenging, as it is so closely linked to individual behaviour and cultural attitudes toward food.” It is necessary to understand the behaviours and cultural attitudes, linked to restaurant food waste practices, in order to minimize or prevent the creation of this type of waste. To research food waste practices in restaurants, within a specific municipality, understanding the environmental surroundings and situational contexts is imperative. To help reach food waste goals, as proposed by the Swedish government, an environmental and sustainable perspective is needed in the study of restaurant food waste practices.

1.3 Aim

The aim of this study is to investigate food waste practices in restaurants, within one municipality, during a time of awareness and efforts to change and address the food waste issue.

To achieve this aim, the following research question is applied:

What influences food waste practices in restaurants?

The project includes a case study of four restaurants in Uppsala municipality. The focus is on their current food waste practices as well as how they have changed their practices over time. A full description of the research project method is provided in chapter 2.

1.4 Outline of the study

The following figure 3 outlines the chapters of this study with the purpose to provide the reader a guide to understand the flow and direction of the remaining report.

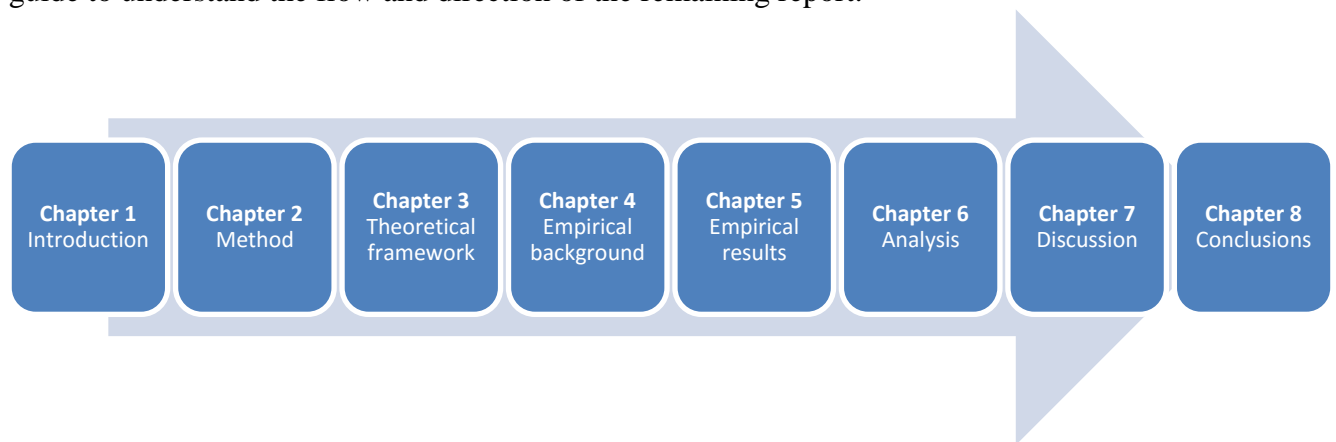


Figure 3: Report outline.

Chapter 1 – provides the necessary background information, problem and aim of the project

Chapter 2 – accounts for the selected research methods used in the project

Chapter 3 – contains an explanation of the chosen theories and the theoretical framework

Chapter 4 – provides empirical background information to support the empirical results

Chapter 5 – presents findings from the case studies

Chapter 6 – connects and analyzes the empirical findings and the theoretical framework

Chapter 7 – revisits the research question, and relates how this study connects with other studies

Chapter 8 – reconnects with the aim, summarizes key findings and suggests future research ideas

2 Method

This chapter describes the research approach, data collection methods, the literature review, delimitations, quality assurance and trustworthiness, and ethical considerations of the study.

2.1 Approach

This project uses a *qualitative, flexible* approach. Flexible design has developed from the qualitative tradition and while there are small differences in the two approaches, in this report they are used synonymously. Qualitative research depends on observing and interacting with people in their natural environment and the researcher interprets the meanings of the gathered data (Kirk & Miller, 1986) and is concerned with theory building and the understanding that “individuals construct and make sense of their world” (Robson, 2011, 24). Social constructionism, sometimes referred to as interpretivism, is the philosophical foundation of the qualitative approach and it views social properties as constructions by people and indicates a focus on how the world is interpreted by those involved in it (Robson, 2011). The inductive logic used in this approach starts with data collection from which theoretical ideas and concepts emerge (*Ibid.*). The qualitative approach uses “purposeful sampling, collection of open-ended data, analysis of text or pictures, representation of information in figures and tables, and personal interpretation of the findings” (Creswell, 2014, xxiv). The approach in this thesis uses a flexible design which is appropriate when exploring relatively new areas of research where it is important to stay open to what is happening and to what you are seeing when you collect the data (Robson, 2011). Furthermore, a flexible or qualitative design allows the researcher to make changes throughout the whole process such as adjusting data collection tools, or changing the data sources (Robson, 2011; Eisenhardt, 1989). This allows the researcher to take advantage of opportunities within the given settings to improve the research and theory building (Eisenhardt, 1989). The findings and results in a qualitative research approach are not generalizable and the research takes place in the natural setting or context (Robson, 2011). The intention is not to generalize the findings from this research across the hospitality sector, but rather to understand the meanings individuals give to a social or human problem by looking at the practices within the specific restaurants included in the study.

2.1.1 Case study

Case studies are commonly used when researching the real world or when using a flexible or qualitative approach (Robson, 2011; Stake, 2008). According to Eisenhardt (1989), case studies are used to understand dynamics within a given setting and are used with a combination of methods in data collection such as archives, interviews, questionnaires, and observation. Yin (2009) describes a case study as a research strategy when how and why questions are posed, when the researcher has little control over the events, and the focus is on a contemporary phenomenon within a real-life context. A case study approach is chosen as the study focuses on food waste as a phenomenon and looks at food waste practices within a specific setting.

Critics of the case study method question the rigor of case study research (*Ibid.*), believe the direction of the findings and conclusions are biased (Yin, 2009; Eisenhardt, 1989), and believe it provides little basis for scientific generalization (Yin, 2009). The criticisms are relevant, but could be addressed using several methods. According to Yin (2009), *triangulation* is attained by using multiple sources of evidence, such as interviews and participatory observation, for the many variables. This is what helps make “case study research ‘hard,’ although it has classically been considered a ‘soft’ form of research” (*Ibid.*, 2). He goes on to explain “the case study’s unique

strength is its ability to deal with a full variety of evidence – documents, artifacts, interviews, and observations” (*Ibid.*, 11). The quality assurance and trustworthiness of this thesis are further explained in section 2.5. The multiple sources of empirical evidence – interviews, participatory observation, and secondary sources – used in this study are further explained in section 2.2.

2.1.2 Choice of case and unit of analysis

In a case study approach the *choice of case* and *unit of analysis* are important to determine. Regarding the choice of case, Eisenhardt (1989, 537) states, “the population defines the set of entities from which the research sample is to be drawn.” In this research project, the sample, or case studies, was drawn from the whole restaurant population of Uppsala restaurants. The city of Uppsala is chosen for several reasons. Within Sweden, the collection of sorted waste, which includes sorting of food waste, is not practiced in every municipality (www, Naturvårdsverket, 3, n.d.). Uppsala is one of the municipalities which mandates restaurants to sort food waste and they have a waste plan that complies with the EU waste hierarchy (www, Uppsala Vatten, 1, 2015). By choosing restaurants that operate in a municipality that enforces regulations regarding food waste, it is interesting and important to observe how these enforcing factors affect the practices in restaurants.

Choices of entities in the case study approach are chosen to fill a theoretical gap, not for statistical reasons, and could provide examples of polar types (Glaser & Strauss, 1967; Eisenhardt, 1989). Due to this, four restaurants in Uppsala are chosen based on the type of service offered. Two restaurants are considered; quick serve restaurants (**QSR**) and the other two, full service restaurants (**FSR**). The service styles or systems differentiate the two types. In QSRs, customers form a queue before ordering at a counter, choose meals from a limited menu, food is prepared quickly and served in disposable containers, customers take the food and seat themselves in the dining area, the table is not waited by staff, and the customer is expected to dispose of the garbage in provided bins (Baraban & Durocher, 2010). In FSRs, customers are seated by waiting staff, order from a pre-set menu, the order is given to the chefs, meals are served to the table, and clean-up of the meal is also done by the waiting staff (*Ibid.*). Restaurant food waste data in the literature does not distinguish between different types of restaurants, the intention is to gain an understanding of practices from different styles of restaurants. Lists of restaurants in Uppsala were drawn up according to the type of restaurant and specifically selected based on this. Eisenhardt (1989) supports this method of selection by stating that random selection is not necessary nor even preferable in case study research.

The unit of analysis is the component of the study that is interested in the fundamental problem or the component of what or whom is being studied (Yin, 2009). It is an interpretive issue requiring judgement and choice and is fundamental to the foundation of the qualitative approach where meanings of social constructions are significant (Kirk & Miller, 1986). In this study, food waste practices in restaurants become the unit of analysis as the exploration into how and why restaurants are generating food waste looks at what they do instead of solely focusing on attitudes of stakeholders in the food waste issue. Using social practice theory (**SPT**), helps understand the practices in a period of change, when the EU, Swedish federal and municipal governments are paying more attention to the food waste issue. The theory also seeks explanations beyond attitudes and behaviour in practices to see what other factors affect food waste practices.

2.2 Data collection

The data collected in this study is consistent with the case study approach and uses interviews and participatory observation data as primary, empirical evidence. Secondary data consists of a literature search and online company documents such as websites, Facebook, Twitter, and Instagram accounts.

2.2.1 Primary data

In order to gather empirical, primary data, interviews are conducted for all case study restaurants and participatory observation methods are used for all restaurants except for Crêperie Lemoni, because of the owner's time constraints and lack of staff on the day of the interview. We were able to observe the kitchen staff and the kitchen area briefly, but did not observe nor communicate with any other employees other than the owner. All the chosen restaurants are located in Uppsala city centre.

From online trip advisors, travel guides, and tourist information, restaurants were chosen based on the type of service they offer (described in section 2.1.2) and in total, 17 restaurants in Uppsala were contacted through email, telephone, or in person, and in some cases a combination of all three. During initial contact, the purpose of the research project was described and the respondent given a chance to agree to an interview and of the 17 restaurants contacted, four complied. Reasons for the 13 who did not agree to the interview, were that they either did not return telephone or email messages, they agreed to the interview but could not find a suitable time, or simply stated they did not want to take part. After the interview was completed, the respondent was asked if we could also participate and observe the restaurant food waste practices. Table 1 provides details of the restaurant employees interviewed and the restaurants that allowed us to observe restaurant food waste practices.

Table 1: Interviews and participatory observation records.

Restaurant	Respondent	Position	Interview date	Participatory observation date
Basilico	Shamal	Owner /head chef	June 7, 2016	June 8, 2016
Crêperie Lemoni	Poppy	Part-owner/manager	July 4, 2016	-
Max	Cecilia	Manager	June 17, 2016	June 17, 2016
Zocalo	Simeon	Manager	June 16, 2016	June 20, 2016

Each interview lasted between 25 minutes to 45 minutes and was held at the restaurant premises. The interviews were recorded, transcribed, and summarized along with information from the participatory observation and the online company documents from Facebook, Twitter, and Instagram. All interview respondents were contacted after the interview with follow up questions. A copy of the summarized empirical results was sent to all the respondents to be verified that the data was accurate, the interview responses were interpreted correctly, and that they agreed for the information to be used in this report.

All interviews, except for Poppy's at Crêperie Lemoni, were held in English. The interview with Cecilia at Max was held in English but some of her responses were in Swedish. The Swedish interview as well as the Swedish replies from Cecilia, were transcribed and then translated into English.

Interviews

One method of gaining insight into the phenomenon of food waste practices in restaurants is through *interviews*. Interviews are commonly used by researchers using the qualitative approach (Potter & Hepburn, 2005) and are one of the most important sources of case study information (Yin, 2009). The semi-structured interview, where the interviewer has a checklist of topics to cover, but remains flexible in the order of the topics and the wording, is often used in flexible research approaches (Robson, 2011). This interview technique allows the interviewer to focus directly on case study topics, and is insightful (Yin, 2009). The lack of standardization in a semi-structured interview raises concerns about the reliability of the data (Robson, 2011) due to the possibility of bias from poorly articulated questions or response bias (Yin, 2009). In this project, semi-structured, face-to-face interviews are used. Face-to-face interviews allow the interviewer to build a rapport with the interviewee (Eisenhardt, 1989), and to observe non-verbal cues which may help understand the verbal response (Robson, 2011). A weakness of interviews is that the respondents may provide details based on what they think the interviewer wants to hear, or what they wish to do as opposed to what they actually do (*Ibid.*).

An interview guide was created based on the theoretical framework, presented in chapter 3, and first used in a practice face-to-face interview with Sandra, the kitchen manager of a student union in Uppsala, Sweden. The practice interview provided feedback and insight into the usefulness of the questions. It also uncovered questions or topics in the interview guide that were difficult to understand or were poorly articulated, and as a result, changes were made before other restaurant managers were contacted. A copy of the finalized interview guide is found in appendix 3.

Participatory observation

Another method of data collection often used in the flexible design approach is *participatory observation* where the researcher seeks to become a part of the observed group (Robson, 2011). The researcher may assume many different roles within a case study situation and may even participate in the events being studied (Yin, 2009). This method of data collection is unique and gives the researcher access to otherwise inaccessible information (*Ibid.*). Some state that this method is imperative to gain an accurate portrayal of the case study phenomenon, or restaurant practices in this case (*Ibid.*). A major advantage of participatory observation, according to Robson (2011), is its directness. Here, data is not based on views, feelings or attitudes, but rather on what is actually being done. This type of data complements the information gathered from the interviews as well as from company online documents. During the interview, respondents could respond in ways that may not reflect what they actually do, participatory observation is one method to triangulate or counteract this effect. While participatory observation has benefits, it also has weaknesses. One major issue is concerned with how an observer affects the situation under observation, also referred to as reactivity (*Ibid.*) or bias, due to the participant-observers manipulation of events (Yin, 2009). To address this, we attempted to make the restaurant employees as comfortable as possible and told them that we were not there to judge them, but to simply understand how they worked with food waste.

Table 1 provides details on the restaurants, Basilico, Max, and Zocalo, where the participatory observation method was used in data collection. After the interview, the respondents were asked if they would allow us to observe their food waste practices. At Basilico and Zocalo, alternative dates were offered for us to conduct the participatory observation, while at Max, the manager allowed us to take part directly after the interview. Each participatory observation lasted approximately one hour and provided real life insight into food waste handling practices. In order to collect similar

data from all of the restaurants, a descriptive observation guide was used. A copy of the guide and the type of data observed and gathered at the three restaurant locations is found in appendix 4. Unlike the interviews which were recorded, notes were kept during the participatory observation with particular attention paid to food waste practices.

2.2.2 Secondary data

Secondary data is collected to form the basis for a literature review, background information, method, theoretical framework, and to support the primary, empirical data. There are two types of secondary data collected for this thesis, firstly, a literature review, which requires a search of relevant articles to understand the phenomenon and topic of the report. Secondly, secondary data is collected to form the empirical evidence for each case study restaurant.

Secondary data in review of literature

In the search for academic, peer-reviewed articles regarding the topic and phenomenon of food waste, searches were made in the Swedish University of Agricultural Sciences (SLU) library, ScienceDirect, Web of Knowledge, Google Scholar, Primo, Proquest, and JSTOR databases. Within these databases, search terms such as EU food legislation/waste policy, Swedish food legislation/waste policy, food waste/loss, food waste attitudes and behaviour, food waste practices, SPT, triple bottom line (TBL), sustainability management, stakeholder theory, or a combination of these terms were used.

While the majority of the secondary sources in the literature review used in this thesis are academic, peer-reviewed articles, several reports, such as reports by the FAO, UN, WRAP, national, and municipal documents are not. Typically these types of reports or documents would not be used to describe the phenomenon in a literature review in a master's thesis, but since much of the academic, peer-reviewed literature referred to these documents and held them as valid sources of information, it was deemed acceptable to include them in this thesis as well as a part of the literature review. The process and choices in the literature review are further discussed in section 2.3.

Secondary data as empirical evidence

Secondary data as a source of empirical evidence, such as publically available company websites, Facebook, Twitter, and Instagram accounts, are used in this case study. Referred to as documentation, Yin (2009, 103) writes that it “plays an explicit role in any data collection in doing case studies.” Some of the strengths in using documentation as a source of evidence is that it is stable and could be viewed repeatedly, it is unobtrusive which means it is not created as a result of the case study, it is exact and contains names, references and details, and finally, it has a broad coverage which could have a long time span and many events (Yin, 2009). While it has many benefits, it also has some weaknesses. It could provide biased information, as the authors post only the information they wish to provide and it could also prove to be a problem if the researcher is biased in the selection of the documents. The first problem of author bias is solved by triangulation, which is using multiple sources of evidence to validate facts and findings (Rowley, 2002). A full account of quality assurances taken in this research project is found in section 2.5. The second problem of researcher bias is solved by using a systematic search to uncover restaurant websites and social media sites. The following table 2 provides details of the websites and social media sites used by the case study restaurants.

Table 2: Restaurant websites and social media accounts.

Company	Website	Facebook	Twitter	Instagram
Basilico	X	X		X
Crêperie Lemoni	X	X	X	X
Max	X	X	X	X
Zocalo	X	X	X	X

Each website and social media account was searched to uncover information, if any, regarding sustainability programs and especially food waste information and policies. All of the restaurants owned websites, and had company Facebook, Twitter, except for Basilico, and Instagram accounts but not all mentioned the programs and initiatives regarding food waste or other sustainability programs. Out of all the websites and social media sites, Max's website is the only restaurant addressing food waste. Some of the websites and social networking accounts were in Swedish only. This information was translated into English for the purposes of this research project.

2.3 Literature review

The aim of the literature review is to provide an understanding, through the relevant literature, about food waste in the EU and Sweden. According to Robson (2011, 59), "the 'literature' is what is already known, and written down, relevant to your research project." It also provides the background knowledge to understand what is known about food waste research in developed countries, and especially the EU. The literature review also helps identify the empirical and theoretical gaps in which our research questions and aim are developed and built upon and also shows potential future research topics or areas. In order to gain a clear understanding of the empirical gap, literature regarding food waste at the end of the food supply chain, with a focus on the hospitality sector, was searched. A documentation of the all of the reports regarding food waste in restaurants is found in appendix 5. This appendix describes the nature of the articles that are about or touch on food waste in the hospitality sector and restaurants in the EU or Sweden and helps uncover our empirical and theoretical gap. The dates of the relevant articles and reports used, indicate that food waste is a very current and growing topic that is gaining more attention. Prior to 2010, there were very few papers written regarding the hospitality sector and food waste. Between 2004 and 2013 no academic, peer-reviewed articles regarding food waste in Swedish restaurants or the Swedish hospitality sector were found. Results of the literature review are found in the introduction, method, theoretical framework, and empirical background chapters.

2.4 Delimitations

This section outlines the delimitations and reasons behind the methodical, theoretical, and empirical choices. Furthermore, it describes the boundaries we have set for the study.

2.4.1 Methodical delimitations

The flexible or qualitative approach is used for topics that have attracted little research or formal theorizing, or when they focus on a new phenomenon (Edmondson & McManus, 2007). The focus of this study has not been studied to a great extent, there is little research on food waste practices within restaurants in Sweden, and as a result the qualitative approach has been utilized in this thesis. A case study approach using interviews and participatory observation are also used for the same reasons a qualitative approach is used. Eisenhardt (1989) and Yin (2009) both suggest that case studies are an appropriate approach when the area has little research and when existing theories and empirical evidence on the topic is scarce. This study has been delimited to interviews,

participatory observation, and secondary data methods in data collection. Interviews, according to Yin (2009), are an essential source of case study information and participatory observation data collection chosen for this study provides more detailed knowledge and creates triangulation in the study.

2.4.2 Theoretical delimitations

The theories and concepts, TBL, stakeholder theory, sustainability management, and SPT have been used to understand the phenomenon of food waste practices in restaurants. SPT suggests that individuals and their environments are in a reciprocal relationship with each other and explains how human actions are embedded in social practices (Shove *et al.*, 2012; Reckwitz, 2002; Warde, 2005). While SPT provides the theoretical foundation of the study, it is necessary to understand SPT within the context of the environment and this is where sustainability management, stakeholder theory and the TBL are seen to influence and are used to understand the practices created and carried out by individuals in the larger environment. SPT is used as the main theory, supported by the other mentioned theories and concepts, foremost because of its suggestion that individuals and their environments are in a reciprocal relationship with each other. It is necessary to view the practices or behaviours of individuals and restaurants by understanding how they interact with their environment and the elements that affect a routinized behaviour. Secondly, these theoretical choices are also driven by the characteristics of the qualitative approach where the researcher observes and interacts with people to interpret the meaning of the constructions (practices) of the environment. The qualitative approach philosophy foundation sees social properties as social constructions (Robson, 2011), so too does SPT. According to Nicolini (2012) regarding SPT, practices are constantly changing social constructions. Practices must be considered beyond the individual's and look at the government and institutions and how they affect social change (Shove, 2010). This provides the rationale for using SPT in conjunction with supporting concepts and theories as the framework to understand food waste practices in restaurants.

2.4.3 Empirical delimitations

As mentioned earlier, most food waste in developed countries, such as Sweden, occurs at the retail and consumer stages of the supply chain (Lungqvist *et al.*, 2008) and for this reason the focus of this study is on the end of the supply chain. On top of this, food waste at the end of the supply chain has used up more resources than food waste occurring at the beginning of the chain (FAO, 2013). Very few academic, peer-reviewed papers are written regarding the hospitality sector or restaurant food waste in the EU or Sweden (see appendix 5) and much of the end of the supply chain, food waste literature looks at the retail and household levels (NCM, 2012). While food waste occurring at the beginning of the food supply chain at the farmer and producer levels is interesting and relevant to understand food waste, it is necessary to narrow the scope since a report covering the entire food supply chain would not be focused enough to fit the requirements of this thesis.

The hospitality sector is large and covers a range of different types of organizations. Globally, according to Schneider (2013b), much of the literature on food waste in the hospitality sector looks at food waste from airlines in Africa and Asia, or in hospitals in the UK, Australia, Malaysia, and Brazil. The compiled literature, used to understand food waste from restaurants, is narrowed down to the hospitality for-profit sector. According to WRAP (2011a & 2013), the hospitality sector is split into two subsectors, the for-profit and cost sectors. The for-profit sector is “where providing catering and/or accommodation services is the primary purpose of the business and where the aim is to maximize profit” (WRAP, 2011a, 2). Restaurants, hotels, guesthouses, bed and breakfasts, QSRs, and pubs fall under this category (WRAP, 2011a). The cost sector, which includes catering,

and accommodation services within schools, hospitals, prisons, and military facilities, is described as “businesses where providing hospitality services is not the main function of the organization and where the aim is not to maximize profit” (*Ibid.*, 2). In the literature review, articles written only about the hospitality cost sector were not considered.

2.5 Quality assurance and trustworthiness

This section includes a description of the measures taken to ensure quality and trustworthiness throughout the research process as well as an acknowledgement of the trustworthiness of the figures and data from existing literature.

2.5.1 Reliability, validity, rigour, bias

In order to attain trustworthiness and *rigour* in qualitative research, *reliability* and *validity* must be attained (Robson, 2011; Morse, 1999). Robson (2011) states that *bias* is an issue that is present in every flexible approach study involving people. Reliability in research is “the extent to which a measurement procedure yields the same answer however and whenever it is carried out” (Kirk & Miller, 1986, 19). Validity could be defined as “the quality of fit between an observation and the basis on which it is made” (*Ibid.*, 80), or “the degree to which the finding is interpreted in a correct way” (*Ibid.*, 20). The trustworthiness of flexible research approaches is the subject of debate due to the lack of standardized means of assuring reliability and validity (Robson, 2011). Along the same lines, Riege (2003) writes about the advantages of the case study method, but asserts that case study method reliability and validity is also scrutinized. Issues of reliability are concerned with the standardization of the research instruments and whether the tool or instrument used produces consistent results (Robson, 2011). Issues of validity derive from inaccurate or incomplete data (*Ibid.*).

To attain reliability, Rowley (2002), proposes to demonstrate that the operations of the study could be reproduced with the same results by documentation of procedures and appropriate record keeping. Robson (2011) suggests being thorough, careful, honest, and keeping full records of activities throughout the research process. Triangulation, using evidence from different sources to validate facts or findings (Rowley, 2002), is a method used to achieve validity and according to Robson (2011), it also enhances the rigour of the research. The triangulation method also “helps to identify different realities” (Stake, 2008, 133).

2.5.2 Quality assurance measures

Riege (2003) and Yin (2009) suggest four tests, which are commonly used in social science research, to ensure validity and reliability during each phase of the case study research process. The first test, construct validity, is concerned with establishing appropriate operational measures for theoretical concepts being researched (Riege, 2003, 80). Internal validity, the second test, deals with establishing phenomena in a credible way (*Ibid.*). The third test, external validity, attempts to determine the generalizability or transferability of a study’s findings (Riege, 2003; Yin, 2009). The fourth and final test, reliability, refers to the repeatability of the research. The researcher must demonstrate that the research could be repeated with similar results (*Ibid.*). The following table 3 outlines the tests and the measures in this report that were taken to ensure reliability and validity throughout the research process.

Table 3: Establishing validity and reliability in case studies (Modified from Riege, 2003, 78-79; Yin, 2009, 41).

Case study design tests	Case study tactics	Method applied in this thesis
1. Construct validity	Use multiple sources of evidence	Triangulation-interviews, participatory observation, secondary data sources, perspectives, documents
	Establish chain of evidence	Summarized interviews, notes of observation during participatory observation
	Key informants review draft case study report	Empirical results verified by interview respondents
2. Internal validity	Pattern matching	Highlights of patterns of similarities and differences from respondents in empirical results
	Explanation/logic building	Diagrams and models used to explain and describe theoretical framework used in analysis
	Assure findings/concepts are systematically related	Theoretical framework applied to empirics and data collection methods and questions are based on framework
3. External validity	Use replication in multiple-case studies	Same interview guide (see appendix 3) used in all interviews; during participatory observation, the same guidelines (see appendix 4) also used
	Define scope and boundaries of research	Method chapter, and especially delimitations, discuss this in detail, but not generalizable findings as based on only few case studies.
	Compare evidence with extant literature	Analysis compared with extant literature in discussion and analysis and analysis of empirical findings built around theoretical framework
4. Reliability	Give full account of theories and ideas	Done throughout thesis
	Assure congruence between research issues and features of study design	Done throughout chapter 2
	Use case study protocol	Sections 2.2, 2.3, 2.4 describe the protocol in this study
	Record observations and actions as concrete as possible	Interviews recorded; notes taken during participatory observation and summarized/documented right after the observation
	Develop case study database	Creation of shared document files that held all contacts, recorded, and summarized empirical data
	Use meaningful parallelism of findings across multiple data sources	Same framework and design protocol used in all interviews and participatory observation; theoretical framework applied to analysis of empirical data
	Use peer-review/examination	Proposal and half-time seminar with supervisor and peers; final read through by peers, opposition for final presentation version of report

These four tests and the tactics for each are deemed suitable in attaining quality in case study research (Yin, 2009). By following these tests and tactics, it demonstrates that a thorough process is used to ensure quality and trustworthiness in the research project.

We are aware that the results from this study may be biased as the case study restaurant managers/owners/chefs who agreed to the interviews, were open and transparent regarding their restaurant practices. If the restaurants who did not agree to the interview were included in the study, perhaps their responses would change the results of this project.

2.5.3 Trustworthiness of food waste figures and differences in terminology

There may be issues due to the variation in the use of terminology in the literature and data. According to the Fusions (2015) report, EU statistics regarding food waste differ from member nations because they use different definitions and criteria. The authors go on to state that “policies, measures, or initiatives aimed at preventing or managing food waste cannot be effective if they are not based on precise and sound data” (*Ibid.*, 7). The differences also affect policy consistency (Fusions, 2015).

Many studies attempt to measure food waste but within the hospitality sector, there are factors that may hinder true numbers. Listed below are some of the reasons, uncovered by the NCM (2012) report, why food waste amounts may not reflect reality.

- Only a few studies include beverages in the waste data
- Some food and beverages are sent back to the suppliers
- Some food is donated to food banks⁶
- Water is sometimes added to food, which distorts weighted food waste data
- A large part of food waste from restaurants is fat or oil, and it is unclear whether or not this is included in the food waste data
- Some food goes to the sewer when dishes are washed; some sinks are outfitted with in-sink food disposers which grind up food items and send the food down the drain (Evans *et al.*, 2010)

In our own research we uncovered discrepancies in food waste data figures in Sweden. The 2012 food waste data from restaurants was initially 142 000 tonnes of which 88 000 tonnes was avoidable (SEPA, 2012a, 6). In 2014, SEPA began calculating food waste amounts using a new model (www, Naturvårdsverket, 1, n.d.). This new model changed the amounts of restaurant food waste in 2012 from 142 000 to 79 000 tonnes (www, Naturvårdsverket, 1, n.d.). The amounts for 2014, calculated using the new model, are discussed in section 1.1.3. of this report.

2.6 Ethical considerations

An important element in qualitative, real world research involving other people is ethics and these types of issues exist in many phases of the research process (Bryman, 2012). Diener and Crandall (1978) use four, somewhat overlapping, principles or categorizations to discuss ethical issues in qualitative research. The first principle discusses whether there is *harm to participants*. This could mean harm to the participants as well as harm to the researchers and could include physical harm, harm to development, loss of self-esteem, and stress (Bryman, 2012). Confidentiality of records is

⁶ A food bank is a redistribution centre, often operated by a charitable organization, where edible food items, from retail stores or the hospitality sector, are donated to people in need (NCM, 2012).

also an aspect of harm to participants, and the identities and records, should be kept confidential (*Ibid.*) if the research participants wish to remain so. The second categorization deals with whether there is *lack of informed consent*. Informed consent is obtaining permission from the participants to be a part of the study after being given full details of the research purpose and process and not covertly performing research (*Ibid.*). The third principle looks at whether there is an *invasion of privacy*. This principle is similar to informed consent to the degree that detailed information outlining the purposes and process of the research should be given to the respondent before obtaining permission to include them in the study (*Ibid.*). Issues of privacy are connected to issues of anonymity and confidentiality and should be respected (*Ibid.*). As well, covert methods in the research process may invade the privacy of study subjects (*Ibid.*). The fourth and last category is concerned with whether *deception* has occurred. “Deception occurs when researchers represent their work as something other than what it is” (*Ibid.*, 143). To conduct ethical research means that the researcher follows a code of conduct in the research process “which ensures that the interests and concerns of those taking part in, or possibly affected by, the research are safeguarded” (Robson, 2011, 15).

2.6.1 Measures to ensure ethical considerations

The following section uses the four principles of ethical issues and explains our methods to ensure the research process was ethically conducted.

Harm to participants

Respondents were given the choice to remain confidential in the research paper, as well, respondents were treated cordially and with respect.

Lack of informed consent

All participants were approached either by email, telephone or in-person and explained who we were, the institution we were representing, the purpose of the project and length of time the interview would take. Before the interview, respondents were also asked if the interview could be recorded. After the interview, the participants were given the choice to allow us to observe and take part in the kitchen and dining room practices. Finally, before the interview and observation data was used in the thesis, the respondents were provided a summary of the data to ensure that we captured the correct information.

Invasion of privacy

Similar to the previous principle, before the interview or participatory observation took place, respondents were provided the purpose of the project, and given the choice to take part and to provide information they were comfortable giving. By allowing the respondents to verify the summarized details of the interview, they were able to determine what they wanted to become public.

Deception

In order to ensure the interview respondents were not deceived, the purpose of the interview and research project were clearly outlined. As well, the reputation of SLU and of us as researchers, were at stake and we did not want to harm or deceive the respondents who were willing to sacrifice their time and energy for our project.

3 Theoretical framework

This chapter provides the theories and concepts of the TBL, stakeholder theory, sustainability management, and SPT. These different theories and concepts are summarized in a conceptual framework at the end of this section which is then used in chapter 6 to analyze the empirical results.

3.1 Triple bottom line

John Elkington first originated the TBL concept in 1994 and since then the concept has been widely used and studied (Elkington, 2004; Hall, 2011). The concept is used to measure the sustainability of a company and many companies today have stated sustainability, the core of the TBL concept, as a corporate goal (Hall, 2011). This shows an interest in moving from traditional measures of company performance focusing on shareholder value, return on investment and other financial profits and results to include both social and environmental dimensions of company performance. There is also evidence that companies that incorporate sustainability into their core values have greater long-term profitability (*Ibid.*). Today most companies are aware that there are financial costs and risks associated with environmental damage and failure to live up to a society's expectations on social standards, which could possibly result in a bad reputation and litigation costs (Rogers & Ryan, 2001).

The definition of TBL used in this report is as follows, “the triple bottom line captures the essence of sustainability by measuring the impact of an organization’s activities on the world ... including both its profitability and shareholder values and its social, human and environmental capital” (Hall, 2011, 4). It is difficult to find an accurate way of measuring a company's social and environmental performance. Some argue that estimating and monetizing a company's social and environmental performance and adding them to the financial bottom line is a way of estimating a company’s sustainability. However, many are opposed to this method, arguing that it is difficult to put a monetary value on such things as a forest, unpolluted air, job security or a safe work environment (Rogers & Ryan, 2001; Hall, 2011). The issue of finding a common measure means that it is up to each company to interpret and decide what framework to use for the three dimensions of the TBL, which means that the concept is applicable to most projects and companies (Hall, 2011).

The economic bottom line relates to economic variables that affect the flow of money in a company. Examples include profit, expenditures, business growth and payed taxes (Hall, 2011). The environmental bottom line is concerned with natural resources and how they might be affected by company activity (*Ibid.*). Access to education and other social resources, employment, and quality of life are examples of variables that affect the social bottom line (*Ibid.*).

Today, many companies are blamed for different environmental, social and economic problems present in society as well as for profiting at the expense of the community (Porter & Kramer, 2011). Many of these companies still have an outdated approach to value creation as they prioritize short-term economic goals rather than taking the needs of those who will influence their long-term financial performance into account (*Ibid.*). There is a presumed trade-off between economic success and social progress. Externalities, such as pollution caused by company activity, are consequences they do not have to take direct responsibility for (*Ibid.*). However, as Porter and Kramer (2011, 4) argue, “companies must take the lead in bringing business and society back together.” This can be done with the creation of shared value. Shared value focuses on the connections between societal and economic progress, resting on the argument that societal needs, and not solely economic needs, define markets and that neglecting societal needs or causing

environmental or societal harm can create internal costs for companies (Porter & Kramer, 2011). Instead of ignoring them, companies could address environmental and societal issues without suffering economic losses by applying new technologies and innovations and by using new management strategies or by operating differently (*Ibid.*). This could in fact lead to increased company productivity and expansion to new markets (*Ibid.*).

3.2 Stakeholder theory

Freeman introduced the concept of stakeholders in the corporate world (Freeman, 1984). Different crises have shown that corporations and their actions can have an effect on people and institutions all over the world, but also that the actions of people and interest groups can disrupt a corporation's pursuit of its objectives (Parmar *et al.*, 2010). These revelations have caused corporations, institutions and researchers to rethink the role and responsibilities of the corporation (*Ibid.*).

In the literature the words 'stakeholder', 'stakeholder management', and 'stakeholder theory' are sometimes used with different meanings, however, they centralize around the same core ideas. The unit of analysis of stakeholder theory is the relationship between the corporation and the stakeholders (Hörisch *et al.*, 2014). The definition of a stakeholder can vary between being broad and fairly narrow. Freeman (1984, 46) defines a stakeholder broadly as "any group or individual who can affect or is affected by the achievement of the organization's objectives." An alternative definition according to Ackoff (1974) states that stakeholders are groups of people and individuals, such as customers, suppliers, financiers, employees, and communities which the company needs in order to exist.

Stakeholder theory can be applied to various settings and is used in different ways (Donaldson & Preston, 1995). This results in stakeholder theory appearing implicit and difficult to describe. Donaldson and Preston (1995) make a division of three different uses for stakeholder theory. Firstly, stakeholder theory is used to describe corporate behaviour and the nature of a firm. This includes how the corporation is run and how it is managed. Secondly, instrumental use of stakeholder theory connects stakeholder management with the achievement of traditional objectives of a corporation such as profit and growth. Studies on the subject suggest that living up to stakeholder practices and principles will help the corporation to achieve conventional goals or even out-perform them. The previous two versions of stakeholder theory recognize different values, while the third and normative use of the theory rests on the general belief that stakeholder management should be applied in an organization because it is morally right and fair. The three different perspectives argue for the importance of stakeholder theory and why it should be applied in organizations (*Ibid.*). Hörisch *et al.* (2014) prefer integrative stakeholder theory which integrates all three previously mentioned perspectives of stakeholder theory.

The stakeholder perception of a corporation is different from the traditional input-output perception. The input-output model of a corporation states that people or groups, such as employees and investors, provide input which the corporation then turns into output for the benefit of its consumers who buy and consume the produced output (Donaldson & Preston, 1995). In contrast, the stakeholder perception of the corporation argues that all people and entities with a legitimate interest in the corporation are showing interest because they reap benefits from it and its success (*Ibid.*). All stakeholders are benefiting from the relationship and all stakeholders both give and receive output from the company (*Ibid.*). Figure 4 shows an illustration of the stakeholder model.

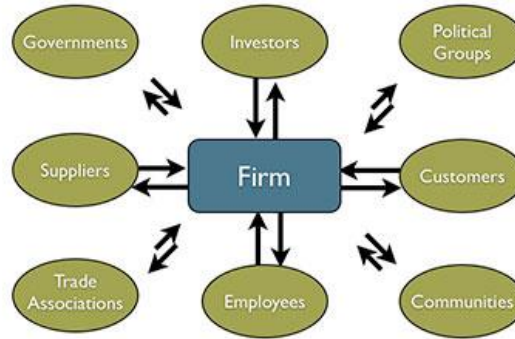


Figure 4: Stakeholder model (Donaldson & Preston, 1995, 69).

The model also illustrates how, according to stakeholder theory, no group or their interests should be prioritized over another. Since stakeholders might perceive the goals and purpose of a firm differently, company management should not only care about the shareholders primary concern which is profit, but also care for the concerns of other stakeholders (Parnell, 2008).

Although popular, stakeholder theory has some shortcomings. While it takes into account the interests of other groups rather than just the shareholders, it is limited to the interests of human beings. Non-human stakeholders such as the natural environment will therefore technically not be taken into account which can lead to ethical dilemmas for the company management (Orts & Strudler, 2002). Company management must therefore include these ethical values in their decision-making even if stakeholder theory is not able capture them (*Ibid.*).

3.3 Sustainability management

Companies are important actors and have a big influence on the economy and society (Schaltegger *et al.*, 2012). It is important to look at how companies are run and managed, as their decisions and actions will have economic, social and environmental implications. The term sustainable development is defined in the Brundtland report (1987, 1) as “the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” The implications of the report are that the social and economic development of societies must be done in a sustainable way. This means that development should take place taking into consideration the natural environment and social aspects. Social sustainability is achieved by striving to meet the basic needs of all people and making sure that all have an opportunity to satisfy their aspirations for a better life (Brundtland, 1987). The sustainable social and economic development of societies include businesses as they form part of society.

Historically, company management and their strategies have focused mainly on the short-and intermediate-term economical outcomes relating to the business strategies (Parnell, 2008). Today some question the long-term viability of strategies that mainly focus on economic outcomes, claiming that for long-term viability, environmental and ecological aspects need to be considered (*Ibid.*). The development of corporate sustainability strategies are important for the sustainable development of businesses and necessary in order to accommodate the sustainability related political, legal, social and economic requirements put on the company (Schaltegger *et al.*, 2012). Traditionally, companies and their management believe the optimal method to comply with sustainability is to do only what is legally required of them (Parnell, 2008). According to this view, managers also think that better environmental or social practices would lead to worse economic

performance (Schaltegger *et al.*, 2012; Parnell, 2008). Sustainability management is concerned with developing and implementing corporate strategies which are sustainable from both industry and environmental perspectives (Parnell, 2008). The field of sustainability management aims to disprove the traditional view that these values are contradictory and fill a gap to build compatibility between the economic, social and environmental dimensions of business strategies (*Ibid.*).

It is argued that there are long-term financial benefits to be gained from adopting a sustainable business model and researchers are investigating the link between voluntary societal activities and economic success (Schaltegger *et al.*, 2012). It should be mentioned however, that not everyone agrees that there is a positive relationship between social performance and economic success. Some authors claim that there is not enough consensus to confirm the relationship and that results show negative or contradictory results (Griffin & Mahon, 1997). For this reason they state that more research is needed to be able to confirm any relationship (*Ibid.*).

Instead of only looking at strategies in terms of competitiveness, management may consider applying a TBL perspective when looking at objectives and strategies. Management can also identify, create and strengthen the links between social and environmental non-monetary activities while also ensuring economic and monetary success for the business (Schaltegger *et al.*, 2012). Knowing and understanding the needs of consumers and society is an important step in achieving long-term success for the company (Porter & Kramer, 2011). It is also important to understand how surrounding societal structures affect behaviours and practices and the dynamic relationship that exists between the two (Nicolini, 2012). Managers may formulate strategies that are based on reality and a thorough assessment of the company and its environment, but since aspects change over time, company strategies must be continuously redefined and reassessed (Parnell, 2008).

3.4 Social practice theory

Over the past 40 years there have been several attempts to create models of human behaviour. (Spotswood *et al.*, 2015). Within the social sciences, researchers have tried to understand what creates social change, what it constitutes and how it comes about (Shove, 2010). Social change has been thought to mainly depend on a person's attitudes and values which then drives the behaviour that individuals chose to adopt in situations (*Ibid.*). Ajzen's (1991) Theory of Planned Behaviour (TPB), among other social theories, is a well-known theory with a model which focuses on changing the attitudes and values of an individual in order to accomplish behavioural change (Spotswood *et al.*, 2015). The TPB has been used when trying to understand social change and how to promote a sustainable lifestyle (Shove, 2010). According to TPB the responsibility for creating social and behavioural change lies with the individuals whose behaviour and choice will make the difference, but by allocating the responsibility to individuals it asserts no responsibility to factors such as governments and institutions and the role they play in facilitating social change and a more sustainable lifestyle (*Ibid.*). Some governments may even foster harmful and unsustainable economic institutions and behaviours (*Ibid.*). With rising environmental challenges it has created a debate among policymakers on how to promote sustainable consumption and environmental behaviour (Hargreaves, 2011). At the centre of the debate is the question: To what extent are individuals capable of bringing about behavioural change by themselves or does behavioural change require more fundamental structural change in society?

Years of research have shown that change is something that cannot be reduced to individual choices about behaviour (Watson, 2012). The TPB model has been criticized for being individualistic and for failing to appreciate how different social relations, material infrastructures and contexts are

intrinsic to the performance of social practices (Hargreaves, 2011; Spotswood *et al.*, 2015). In SPT, behaviour is characterized as habitual and unreflective, rather than planned, as in the TPB (Rettie *et al.*, 2012). The SPT tries to explain why people do what they do by focusing on the practice and the action itself instead of on the individual (Nicolini, 2012; Rettie *et al.*, 2012). To understand why people do what they do, it is necessary to look at the history of the practice as they are continuously developing (Warde, 2005). This is because the shape and form of social practices are conditional to the institutional arrangements that exists at a specific point in time, bound to the current cultural traditions and social contexts, which acknowledges the social construction of practices (*Ibid.*). Reckwitz (2002, 249) defines practice as the following, “A ‘practice’ (Praktik) is a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge.” A practice is the real-time doing of something in a specific time and place (Nicolini, 2012; Warde, 2005). As explained by Nicolini (2012) practices only exist to the extent that they are enacted and re-enacted. When analyzing a practice you are therefore taking the social and material doing of something as the main focus of your analysis (*Ibid.*).

Shove *et al.*, (2012) propose that social practices consist of elements that are integrated when practices are enacted and that practices emerge, persist and cease to exist as the links between the elements are broken and made. Drawing inspiration from Reckwitz’s (2002) definition of a practice, referring to it as a form of routinized behaviour consisting of several elements which are interconnected, Shove *et al.*, (2012) present a model connecting the three elements, materials, competence, and meanings that together explain and form practices. This approach de-centralizes the individual and is consistent with the argument that as individuals are performing a practice they are simultaneously reproducing the practice and the elements of which the practice is made (Shove *et al.*, 2012; Nicolini, 2012). The model includes and unites the thoughts and ideas from other practice theory authors, such Giddens, Schatzki, and Bourdieu (Shove *et al.*, 2012). The following figure 5 shows the relationship between the three elements.

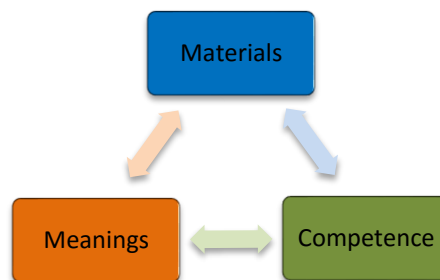


Figure 5: Elements of practice (Shove *et al.*, 2012, 25).

Practices consist of a combination of these interconnected elements and all three elements need to be present for the practice to exist (*Ibid.*).

Materials

This element includes things such as infrastructure, tools, our bodies and other physical objects connected to a specific practice (Shove *et al.*, 2012; Spotswood *et al.*, 2015; Rettie *et al.*, 2012). The materials should be easily accessible and as convenient as possible in order for adoption of the new practice (McKenzie-Mohr & Schultz, 2014). Shove *et al.* (2012) explain material elements as physical objects and/or infrastructure and that their availability plays an important part in

facilitating and enabling a potential practice. Examples of material elements in the practice of driving would be the vehicle enabling the actual driving, and the roads provide the infrastructure necessary for the driving to take place (*Ibid.*). Materials are preferred over others depending on their convenience and this is why McKenzie-Mohr and Schultz (2014) suggest that sustainable material elements such as electric cars or carpool lanes must be perceived as the more convenient option in order for practices to change and become more sustainable.

Competence

This element captures the ‘know-how’, the practical consciousness, acquired skills, the shared understanding for what is considered a desired performance and knowledge (Shove *et al.*, 2012; Spotswood *et al.*, 2015; Rettie *et al.*, 2012). There are different kinds of knowledge. One can have knowledge in the form of a skill but also have knowledge to be able to evaluate a behaviour or action (Shove *et al.*, 2012). Both of these forms of knowledge are included in the competence element (Shove *et al.*, 2012; Spotswood *et al.*, 2015; Rettie *et al.*, 2012).

Meanings

This element encompasses all the mental activities such as emotions and motivations for performing a practice (Shove *et al.*, 2012; Spotswood *et al.*, 2015; Rettie *et al.*, 2012). Meaning can be the shared understanding within a group about a behaviour, or an aspect which brings the group together (Shove *et al.*, 2012). Meanings reflect the social acceptability of a practice and whether it is considered ‘normal’ among different groups (Shove *et al.*, 2012; Spotswood *et al.*, 2015; Rettie *et al.*, 2012).

The practice of household recycling has changed over the past 20 years in the UK and can be used to illustrate the integration of the elements of practice in reality (Rettie *et al.*, 2012). Material objects have changed from single bins to multiple bins and material infrastructures have changed from stationary recycling stations to include pick-up services from houses. The competence and know-how has changed; for example, the information about what, when and where waste is picked-up has changed and recycling regulatory and fiscal frameworks have gone from weaker to stronger (*Ibid.*). The meanings of the household recycling practice have changed from being seen as green and unusual to green and mainstream (*Ibid.*).

Social practices are not uniform nor are they performed the same way by every individual. They differ depending on the individual, the structure and context (Shove *et al.*, 2012; Warde, 2005). For example the practice of driving will be performed differently depending on the individuals past experience, on available resources and technical infrastructure, encouragement from surrounding people and technical knowledge (Warde, 2005). Practices are changing as people everywhere are adapting, improvising, and experimenting and these sources of changed behaviour lie in the development of practices themselves (*Ibid.*). A practice has a specific set of procedures, understandings and goals at a given point in time as mentioned earlier, but as links between elements are broken and made, practices change (Warde, 2005; Shove *et al.*, 2012; Spurling *et al.*, 2013).

By interfering with the elements you can change a practice. This can be done by introducing new materials in the form of new equipment or infrastructure, providing staff training and education to improve competence and skills, or launching an information-campaign to change staff perception and meaning of the practice (Spurling *et al.*, 2013). The fact that practices are constantly developing is important since the adaptability shows how practices might be changed with sustainability objectives (Rettie *et al.*, 2012).

SPT can help to explain how behaviours are formed and how to accomplish behavioural change. The strength of SPT lies in its way of analyzing activity and behaviour in the abstract and to not focus solely on the individual's behaviours and actions (Spotswood *et al.*, 2015). The practice being the smallest unit of analysis allows for not only behaviours and actions to be analyzed but also the context and structure which could lead to more thorough and whole-system solutions (*Ibid.*).

3.5 Conceptual framework

The previously discussed theories are summarized in figure 6 to illustrate the relationships between the concepts and to provide an outline for the analysis.

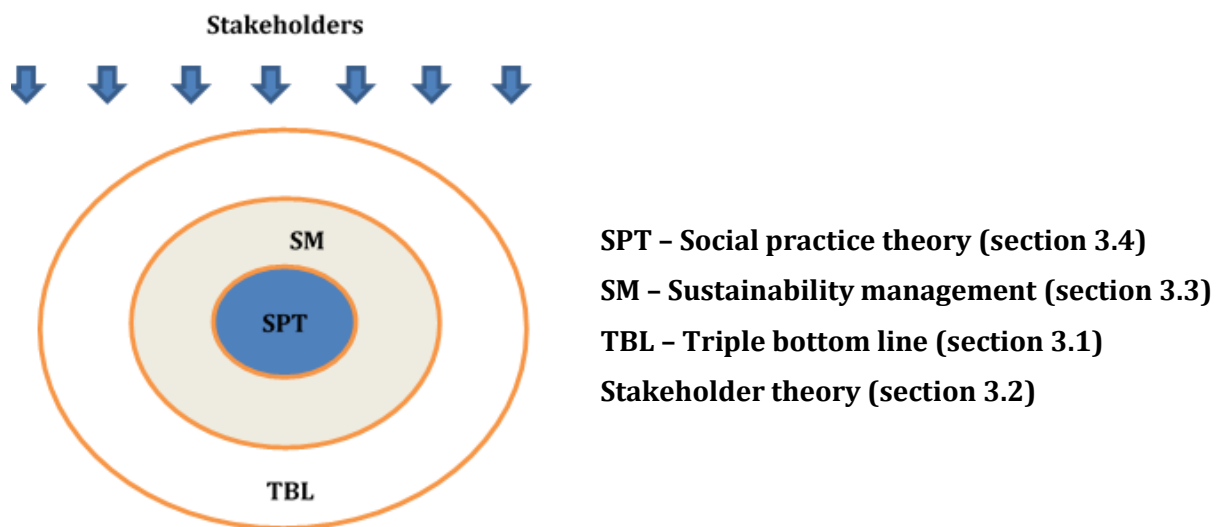


Figure 6: Conceptual framework.

SPT theory serves as an analytical tool to understand the behaviours and practices regarding food waste management in restaurants. The conceptual framework illustrated in figure 6 is an inclusive way to show how the concepts of stakeholder theory, sustainability management, and TBL relate to the restaurant practices. Practices connected to an issue, such as food waste, need to be viewed from a social, economic, and environmental perspective in order to understand the effects of food waste. The concepts surrounding SPT make up the external environment and the influencing factors for restaurant food waste practices. Food waste practices cannot solely be explained by the attitudes, values, and behaviours of the restaurant staff and management, as the socio-technical system or structure in which they operate also impacts the practices. Food waste restaurant practices are influenced by the interaction between societal infrastructures, both concrete and ideological.

4 Empirical Background

In this chapter, information about the Swedish and Uppsala municipality waste disposal system, policies and incentives regarding food waste, and prevention of and sources of restaurant food waste is provided.

4.1 Food waste prevention and minimization efforts in Sweden

The WFD presented in section 1.1.5, requires that each EU member state creates and implements their own waste prevention and minimization plans and goals (www, European Commission, 3, 2016). This responsibility has been assigned to SEPA whose food waste goals of reducing food waste by 20 percent by year 2020, and biologically treating 50 percent of food waste generated by households, food stores, and restaurants by 2018, comply with the WFD (SEPA, 2013, 5; SEPA, 2012b, 32). SEPA also involves and collaborates with many other actors in Sweden, such as the municipalities, The Swedish National Food Agency (NFA), The Swedish National Agency for Education (NAE), The National Board of Housing, Building and Planning (NBHBP), and The Swedish Board of Agriculture (SBA) to help implement resource efficiency in the food chain, plan, and create awareness (SEPA, 2012b). Amongst the other organizations helping with the waste plan, SEPA also calls on shops, wholesalers, catering facilities, and restaurants to manage food waste efficiently, train staff on food waste reduction methods, create systems and methods to minimize food waste and use residual waste and food products before their sell-by or use-by date, reach agreements within the industry to develop systems that does not encourage overbuying or ordering by being able to return unsold food to the wholesaler free of charge, educate, and inform customers about reducing food waste (*Ibid.*). On top of these efforts, the following are examples of initiatives that have been taken within Sweden that affect restaurants regarding food waste.

The Nordic Council of Ministers

This initiative includes three subprojects regarding food waste in the Nordic countries (www, Norden, 1, n.d.). The first project suggests definitions and system boundaries for measuring losses in primary production and estimating volumes of waste in primary production (*Ibid.*). The second project attempts to optimize food labelling to help minimize food waste (*Ibid.*). The final project aims to create a platform for enhancing food redistribution to food banks to help reduce food waste (*Ibid.*).

The Swedish Food Waste Reduction Project 2013-2015

The Swedish Food Waste Reduction Project 2013-2015 (SFWRP), is an initiative by the Swedish NFA, SEPA, and SBA. The goal of this national program is to analyze opportunities and obstacles for reducing food waste, promote increased cooperation between stakeholders, inform consumers and share information to encourage the use of unavoidable food waste for biogas production (NFA, 2014; Livsmedelsverket, n.d.). They spread awareness on the topic of food waste and its consequences to consumers through the launch of the website www.stoppamatsvinnet.se and through advertisement. Through the forming of the Food Waste Reduction Action Group (SaMMA) they have created a networking group consisting of almost 80 member organizations and businesses in the food industry including producers, distributors, food store owners, researchers, government agencies and owners of restaurants and big kitchens (SaMMA, n.d.; Livsmedelsverket, n.d.). This forum has increased the sharing of information, knowledge and cooperation between actors.

Consumer Association (Konsumentföreningen)

The Consumer Association works on a survey designed to uncover information about food waste on the attitudes of doggy bag use in Sweden (Leal Filho & Kovaleva, 2015).

European Week for Waste Reduction

The European Week for Waste Reduction (**EWWR**) is an annual week-long campaign aimed at increasing awareness about sustainable resources and waste management involving public authorities, private companies, civil society and citizens (Leal Filho & Kovaleva, 2015; www, EWWR, 1, 2016).

4.2 Swedish food waste management

The Swedish Waste Management Plan created by SEPA aims to comply with the WFD hierarchy in figure 2 (www, Naturvårdsverket, 4, n.d.) which prioritizes the prevention of waste with the last resort being landfilling. Food that ends up as waste, despite preventative measures, should be treated biologically, rather than incinerated, and preferably turned into biogas (Livsmedelsverket, 2016).

Today about 190 municipalities out of 290 are collecting sorted food waste from restaurants, households and other facilities to be treated biologically (www, Naturvårdsverket, 3, n.d.). By supporting projects, coordinating information and sharing experiences they wish to increase the biogas production from food waste in the municipalities and encourage more municipalities to collect sorted food waste (*Ibid.*).

4.2.1 Methods of food waste disposal

There are four methods of food waste disposal currently in use, or were used in Sweden. The four methods, biological treatment, incineration, landfilling, and animal feed are described below.

Biological treatment

Much of the food waste produced in Sweden is biologically treated. Biological treatment includes anaerobic digestion, which produces biogas to be used as a vehicle fuel, as well as compost, which is a soil conditioner to be used in gardens, parks and landscaping (Avfall Sverige, 2014). Biological treatment is, according to the waste hierarchy of the WFD and Avfall Sverige, energy recovery (*Ibid.*). In 2014 an estimated amount of 935 000 tonnes of food waste was generated by households, restaurants, food stores and big kitchens in Sweden (www, Naturvårdsverket, 3, n.d.). Out of this, 38 percent of the food waste was treated biologically, 252 000 tonnes was anaerobically digested and 99 000 tonnes was composted (*Ibid.*). The SEPA goal, as mentioned in the introduction, is to have 50 percent of the food waste from households, food stores and restaurants treated biologically by year 2018 (*Ibid.*). By anaerobically digesting the waste, the plant nutrients are preserved, energy is extracted, and biogas is produced. During composting the plant nutrients are preserved while the energy is released as heat during the process (*Ibid.*). Anaerobic digestion is the preferred method because it preserves plant nutrients and produces biogas (Avfall Sverige, 2014).

Incineration

Incineration of food waste is also considered energy recovery according to the WFD and Avfall Sverige as the energy from incinerated waste is used for heating and electricity (*Ibid.*). According to SEPA, separated and collected food waste is biologically treated, and food waste that is collected as mixed household waste is incinerated (Naturvårdsverket, 2016).

Landfill

Today, due to new legislation, landfilling is no longer an option for food waste or organic waste disposal. Taxes on landfilled garbage were implemented in 2000 to discourage landfilling of food waste while taxes on incineration have been lifted (NCM, 2012; Legislative Council Secretariat, 2014). On top of this, Sweden has banned the landfill of sorted combustible waste in 2002 as well as organic waste in 2005 (Leal Filho & Kovaleva, 2015, 96). According to the European Commission (2010) report, simply diverting food waste from landfills will not control the bigger issue of food waste generation.

Animal feed

This method of food waste disposal is unclear. According to Naturvårdsverket (2011), food waste could be sold as animal feed. According to the information provided in the NCM (2012) report the system for separate collection of food waste from restaurants and canteens for animal feed no longer exists as it was withdrawn in 2003 due to new EU regulation. This does not mean that food waste cannot be used for animal feed, but the information regarding food waste for animal feed in the EU and Sweden is unclear and very little information is found.

4.2.2 Food waste management in Uppsala

Uppsala municipality has the responsibility to collect, handle and treat all household waste within the municipality from both private households and restaurants (Uppsala Vatten och Avfall AB, 2014). All restaurants in Uppsala have to sort their food waste and keep it separate from other waste (www, Uppsala Vatten, 1, 2015). Food waste is collected by the municipality and treated biologically through anaerobic digestion, then turned into biogas and biofertilizer of which the majority is used to replace diesel and gas in the public transportation system (www, Uppsala Vatten, 1, 2015; Uppsala Vatten och Avfall AB, 2014). The municipality is also required to have a waste plan and regulation for their waste management. The waste plan includes information about how the municipality plans to reduce its waste and account for the consequences and risks of waste management in the municipality (Avfall Sverige, 2014). In Uppsala's waste plan it is stated that by year 2022, 60 percent of the total food waste in the municipality shall be sorted and separated from other household waste (Uppsala Vatten och Avfall AB, 2014, 7). This goal is to be reached by sharing information and education, by developing a separate system for the collection of oils and fats and through visits to facilities and businesses (Uppsala Vatten och Avfall AB, 2014). In the municipal waste plan the re-use and recycling of waste is important and encouraged, but it is emphasized that prevention of waste is the most sustainable and efficient option according to the EU waste hierarchy (*Ibid.*).

4.3 Restaurant food waste prevention in the literature

Waste prevention means not generating food waste to begin with and in restaurants involves a number of activities, starting from menu planning to consumption (WRAP, 2013). The literature debates the issues related to the prevention of food waste as well as providing examples of formal and informal prevention strategies for restaurants.

The NCM (2012) report states that little research has been conducted on avoidable food waste prevention. The same report found that some organizations fear food waste prevention programs may compromise the safety and hygiene of some food items and become health risks. The challenge is to find food prevention methods that work while maintaining hygiene and safety standards. In her 2013b article, Schneider discusses the lack of evaluation methodology or presentation of reliable results in evaluating food waste prevention measures. Quested *et al.* (2013) suggest that

the food waste issue and prevention methods are complex because the behaviours and practices associated with food waste prevention and generation are complicated as they involve a combination of activities and result in a separation of the activity and consequence. The authors continue that the activities involved with food waste generation are done for reasons unrelated to food waste prevention as both are linked to habits and contain an emotional component. On top of this, the practices linked to food prevention are less visible than those linked to recycling (food sorting). The WRAP (2011a) report recognizes that prevention strategies for consumers are challenging for a number of reasons. Firstly, consumers want to feel that they are receiving value for money, therefore portions cannot be too small. Secondly, the issue of expiration dates of products, and lastly the problems associated with predicting business volumes.

The WFD hierarchy prioritizes prevention and once the food waste has been created, it provides alternative methods of waste disposal (www, European Commission, 3, 2016). One of the methods, is to biologically treat food waste for energy recovery but this has been touted to encourage individuals and organizations to not focus on the prevention of food waste (Fusions, 2015). The NCM (2012) study respondents state that there is more focus on the sorting of waste than on prevention. Contrary to these fears, a WRAP (2011b) study on household food waste suggests that the introduction of a food waste collection program could reduce the amount of food waste generated. The respondents reported that they focused more on how much food they were throwing out and as a result they started paying more attention to reducing food waste. Although this study was directed at households, it could have implications in restaurants as well.

Aside from the issue of sorting, prevention methods and initiatives are examined and reported in the literature. These strategies, as either formal or informal organizational policies, are discovered in the existing food waste literature and only the ones affecting restaurants are considered.

- *Awareness campaigns and information tools* – This is informing employees and customers and any stakeholders about food waste through events, reports, etc. (European Commission, 2010; Engström & Carlsson-Kanyama, 2004; FAO, 2011; NCM, 2012).
- *Training programmes* – This includes on-the-job skills and workshops aimed at training employees to help lessen food waste (European Commission, 2010; Engström & Carlsson-Kanyama, 2004; NCM, 2012).
- *Logistical improvements* – This includes stock management, food storage, order flexibility, procurement of food, delivery size and frequency, and packaging in order to lessen food waste (European Commission, 2010; Engström & Carlsson-Kanyama, 2004; WRAP, 2013; NCM, 2012).
- *Waste measurement activity and monitoring* – This method involves quantification and composition analysis of food waste to uncover what and where food is being wasted (European Commission, 2010; NCM, 2012).
- *Research programs* – This method helps to communicate information on the food waste issue, as well as uncover sources of food waste in restaurants (*Ibid.*).
- *Food redistribution programs* – The donation of edible food to charitable organizations (European Commission, 2010; WRAP, 2013) is rarely used as there may be a lack of knowledge of the food bank concept (NCM, 2012; Schneider, 2013a).
- *Menu/production planning* – This involves taking into account the budget, service style and equipment, staff levels, production equipment, production facilities, seasonality, consumer preferences, procurement, and storage type and space in order to fully optimize food usage

(WRAP, 2013; NCM, 2012).

- *Demand forecasting* – This involves using historical data and even using information technology (IT) systems to help keep track of customer preferences in order to minimize food waste (WRAP, 2013).
- *Food preparation* – Depending on the type of restaurant, pre-prepared food creates less waste as it lessens the kitchen or preparation waste, but could mean more packaging waste (*Ibid.*).
- *Portioning and serving* – This includes minimization of plate waste, which is more difficult in buffet style restaurants, but understanding customer preferences may be helpful (WRAP, 2013; NCM, 2012).
- *Consumer and staff behaviour* – Like the previous prevention initiative, portioning and serving, it involves understanding customer needs and offering options such as doggy bags (*Ibid.*).
- *Environmental certifications and eco-labels* – As a commitment to reduce food waste some companies have implemented programs such as ISO 14001 which is seen as successful in helping reduce food waste amounts (NCM, 2012).
- *Incentives* – Providing incentives to employees to help reduce food waste (*Ibid.*).
- *Waste management* – Adopting and improving food waste disposal systems such as sorting for pick up (WRAP, 2013).
- *Regulatory and policy measures* – This includes all types of waste management incentives, such as separate collection of food waste, WFD, and landfill directives (European Commission, 2010).

Regulatory and policy measures require a deeper discussion as they, being formal or informal governing bodies, hold a position in which they could affect much change. The European Commission (2010) report discusses waste policy and states that directives such as the WFD, the Landfill Directive and the Communication on bio-waste management for food waste is neutral in terms of how much waste is created. Once the waste has been generated, this is when these policy measures are able to have a strong impact. The NCM (2012) report states that in the hospitality sector in the Nordic countries, there are commitments to sort food waste, with very little incentive, and no concrete commitments to reduce avoidable food waste. The report also recommends the review of food safety legislation and systems in order to identify possible improvements in the reduction of avoidable food waste while maintaining the safety standards. Regarding informal policies, at the organizational level, very few restaurants have policies directed to waste minimization (WRAP, 2011a).

4.4 Sources of food waste in restaurants

According to the literature on food waste in the hospitality sector, there are multiple causes of food waste in restaurants. The article written by Beretta *et al.* (2013), advises a detailed analysis of the restaurant, as well as uncovering and analyzing the sources of the food waste before suggesting measures of how to reduce food waste. The following section is a compilation from the literature of the sources of food waste in restaurants.

- *Large portion size or customer plate waste* – This is one of the most discussed causes of food waste in restaurants as it is often the main source of food waste (Engström & Carlsson-

Kanyama, 2004; European Commission, 2010; FAO, 2011; WRAP, 2011a; WRAP, 2013; NCM, 2012; Katajajuuri *et al.*, 2014; Silvennoinen *et al.*, 2015). The study by Singer (1979) states that women and children may have more plate waste. The Finnish study by Silvennoinen *et al.* (2015), found that restaurants and diners generated most food waste from customer plate waste. Potato, rice, and pasta made up 29 percent of the plate waste while 25 percent came from leftover salad, vegetables, and fruit (*Ibid.*, 144).

- *Demand forecasting/planning* – Another source of food waste in restaurants derives from poor demand forecasting and planning, also known as serving waste, which is food that is prepared but never served (Garrone *et al.*, 2014; Halloran *et al.*, 2014; Engström & Carlsson-Kanyama, 2004). This type of food waste is more common in buffet style rather than FSR restaurants (Silvennoinen *et al.*, 2015).
- *Preparation/kitchen waste* – This includes mainly unavoidable food waste and is not discussed as a major source of food waste from restaurant kitchens (Engström & Carlsson-Kanyama, 2004; NCM, 2012; Katajajuuri *et al.*, 2014; Silvennoinen *et al.*, 2015). The WRAP (2013) study found this source of food waste to be the biggest contributor.
- *Storage waste* – Storage waste results from poor storage practices and very few articles mention this type in detail (Engström & Carlsson-Kanyama, 2004; WRAP, 2011a).
- *Surplus food not donated* – Food that is not donated is mentioned in several articles (Garrone *et al.*, 2014; European Commission, 2010; Halloran *et al.*, 2014). Surplus food could help mitigate food insecurity by being given to those in need (Garrone *et al.*, 2014). The logistical efforts are mentioned as reasons to why restaurants prefer to dispose of food instead of donating the excess (Garrone *et al.*, 2014; European Commission, 2010).
- *Legislation/regulation* – Hygiene regulations could create more food waste (Fusions, 2015; NCM, 2012). The Fusions report (2015) states that while hygiene measures could prevent excess food waste, strict limitations regarding hygiene could create unnecessary food waste.
- *Labelling* – Labelling is another cause of food waste that could affect restaurants. According to Fusions (2015), there is confusion about the meanings of ‘best before’, ‘use by’, and ‘sell by’ which leads to excessive food waste.
- *Consumer behaviour* – Research shows that consumer behaviour affects food waste in restaurants (Kallbekken & Sælen, 2013; Gjerris & Gaiani, 2013; Aschemann-Witzel *et al.*, 2015). An experiment where social cues were provided and plate size was reduced, food waste was reduced by 20 percent (Kallbekken & Sælen, 2013, 326).
- *Awareness, attitudes, education and training* – The awareness, attitudes, education and training of the public and employees of restaurants are difficult to measure, but literature includes them as causes of food waste (Engström and Carlsson-Kanyama, 2004; European Commission, 2010; NCM, 2012; Aschemann-Witzel *et al.*, 2015). The lack of environmental awareness, knowledge, planning, logistical challenges and attitudes are key causes for food waste in the hospitality sector (European Commission, 2010). Additionally the NCM (2012) report discusses education and training with both employees and customers to help minimize food waste. If the restaurant has high staff- turnover and a high amount of employees who require training, it could be difficult to maintain routines aimed at reducing food waste (www, Naturvårdsverket, 2, n.d.).

5 Empirical results

This chapter provides the results of the empirical data from each case study restaurant. The restaurants are presented in alphabetical order.

The information for each restaurant is gathered from a combination of the interview, participatory observation, except for Crêperie Lemoni, and restaurant website, and where utilized, the company Facebook, Twitter, and Instagram accounts. Table 4 provides basic company information to understand the company profile and background for each case study restaurant.

Table 4: Restaurant information.

Restaurant	Type of restaurant	Menu price range	Meals served	Seats and meals served per day	Number of employees
Basilico Italian cuisine	FSR	125 – 259 (SEK) (main course dinner menu) 85 – 149 (SEK) (pizza menu)	Lunch and dinner (Monday-Friday)	97 seats, serves 100 to 400 meals a day depending on day and season	10-12
Crêperie Lemoni French cuisine	FSR	95 – 129 (SEK) (main course dinner menu)	Lunch and dinner (Monday-Sunday)	85 seats indoors, serves 80-300 meals depending on day	8-10
Max Hamburgers	QSR	34 – 94 (SEK) (hamburger menu)	Breakfast, lunch and dinner (Monday-Sunday)	Around 200 seats indoors, serves 700-1500 meals depending on day	50
Zocalo Mexican cuisine	QSR	89 – 139 (SEK) (tacos, burritos, salads)	Lunch and dinner (Monday-Sunday)	60 seats, serves on average 120 meals a day	7

*Information included in the table is from each respective restaurant website and interview

On top of the information provided in table 4, detailed information based on the interviews, participatory observation, and websites and social media sites, regarding food waste practices within the restaurants is provided in the following sections.

5.1 Basilico

5.1.1 Organizational Structure

Basilico is a privately owned restaurant located in central Uppsala and is not a part of a chain or franchise. The owner and head chef Shamal has been a partner, along with his brother, in Basilico since they bought the restaurant in 2009. All of the information in Basilico's empirics is from the interview with Shamal (Pers. Com., 2016), if not stated otherwise.

5.1.2 Restaurant food waste policy and practices

Food waste in Basilico is sorted into a separate garbage and then brought out every day and evening to a shared bin at the back of the restaurant where Uppsala municipality collects the food waste three to four times a week. The per bin payment of food waste is paid by the owner of the building

to the municipality and included in the rent, but a copy of the invoice is sent to Basilico. Shamal estimates that the restaurant generates between 80 to 100 kilos of food waste a week. The restaurant uses only fresh foods and does not order any frozen items on a weekly basis because they try to prepare everything in the restaurant from fresh ingredients. Food is delivered to the restaurant six times per week. To help manage food usage and to ensure everything at the premises is working properly, Shamal and his partner have hired Anticimex, a company with expertise in food safety. Food inspectors from Uppsala municipality, visit Basilico once a year to ensure that the restaurant is complying with food safety laws and regulations, and the restaurant is fined if they fail in some regard. According to Shamal, the food inspectors are necessary and help ensure that people do not become ill from poorly handled food, and this is important as he could lose customers as a result. Extra food is not donated to homeless or other organizations and liquid waste is poured down the sink.

5.1.3 Food waste management incentives and sustainability practices

According to Shamal two main incentives give reason to sort and manage food waste. The first and main incentive is economic – when the company saves on food waste, they also save financially. As well, the restaurant is fined 900 SEK, by the municipality if waste is not sorted properly. The second incentive to sort and manage food waste, is a desire, inspired by a personal relation to Shamal, to run an environmentally sustainable conscious restaurant. Shamal (*Ibid.*) commented on this factor that “if I reduce food waste by 40 kilo per year it doesn’t make a big difference other than for my pocket, but if all the restaurants in Uppsala save 40 kilo it could help out in environment and society.” This change in perspective also affects thoughts on food waste where both the Swedish and global society and environment could benefit from sustainable practices. Shamal states the Swedish government could help restaurants better manage food waste and operate sustainably by giving bigger fines for improper sorting of waste and providing financial incentives. Shamal has not heard of any of the initiatives to lessen food waste in Sweden and in the EU.

5.1.4 Food waste management initiatives and sustainability practices

Although the Basilico website, Facebook, and Instagram accounts do not state it, the owners have incorporated informal sustainable food waste practices within the company. In the past, food was delivered three days a week, but after realizing that this system was not working, Shamal and his partner decided to get smaller amounts of fresh food delivered daily. Although it cost the company, the new delivery system aids in food ordering management and helps lessen the amount of food waste from six to seven bins of food waste a week to one or two bins. By ordering fresh food daily, it has cut down the need to have many freezers and refrigerators. Shamal states that he has removed three freezers and one refrigerator so the staff does not buy too much food. He has been able to cut down costs of groceries by 30 percent by getting rid of the extra storage. Another initiative is to use all the avoidable and unavoidable parts of food if possible. For example, the unavoidable food waste of skin from a filet of beef is used in the red wine sauce, and the best parts of the filet of beef are used for meals, and smaller parts for pastas, pizzas and buffets. Vegetable peels are used to prepare bouillon instead of purchasing a pre-packaged bouillon. Another way to lessen food waste is an initiative started four years ago which promotes providing and encouraging the use of doggy bags for leftover customer food. Waiting staff are ‘fined’ 1 SEK if they fail to ask customers if they wish to take uneaten food home. According to an employee, approximately 60 percent of the customers who have food left on their plates take food home in doggy bags (Part. Obs., Basilico, 2016).

5.1.5 Training/communication

Shamal trains all staff and one of his training tactics he uses is to take the staff to other restaurants for them to observe how they operate. Since the food portions in Basilico are large, his intention with this tactic is that his restaurant employees could observe how other restaurants serve smaller portions of food. Staff are encouraged to participate and offer suggestions in the management of food waste and this is evident when an employee suggested they change their bouillon practices from buying to preparing it themselves. This utilized an otherwise unusable part of a filet of beef. On top of this, waiting staff are trained to provide customers with doggy bags for leftover food.

5.1.6 Sources of food waste

Most food waste at Basilico comes from uneaten customer food or plate waste. According to Shamal the chefs tend to prepare large portions and he is trying to train them to serve smaller portions (as mentioned in previous paragraph). He would rather have customers ask for more food if not satisfied than to throw away edible food. He has observed a cultural difference in the acceptance of doggy bags in comparison to other cultures. In Sweden, customers are often embarrassed to take home leftover food and are even hesitant to accept a doggy bag when offered one by waiting staff.

5.1.7 Barriers and challenges in preventing and minimizing food waste

Shamal sees food waste as an issue in his restaurant. Customer choices are a challenge in preventing food waste in Basilico as they often order more food than they can eat. The government also poses challenges or barriers in the management of food waste and Shamal believes they could do more to help restaurants. He suggests that the government could give bigger fines to companies who do not sort their food waste. When asked if food safety and hygiene regulation has any impact on food waste amounts Shamal states no, and that the government does not affect food waste levels either.

5.2 Crêperie Lemoni

5.2.1 Organizational Structure

Crêperie Lemoni is a privately owned restaurant operating for five years in the centre of Uppsala. Poppy is part-owner, as well as the restaurant manager since the restaurant opened. All of the information in the Crêperie Lemoni empirics is from the interview with Poppy (Pers. Com., 2016), if not stated otherwise.

5.2.2 Restaurant food waste policy and practices

At Crêperie Lemoni they have always sorted their food waste. The food waste from kitchen preparations and from customer plate waste is put into a separate bin in the dish washing area of the kitchen and brought to the garbage room, shared with other restaurants as well as residents. Plastic, metal, glass and other household waste, such as paper, is also sorted in the restaurant and then brought to the shared garbage room. Liquid waste is poured down the sink. The garbage room is provided by the building facility and Uppsala municipality picks up the waste once or twice a week. The amount of waste is not documented but an estimated amount of food waste per day is two kilos. Food is not donated since to her knowledge, they are not allowed to give food away according to legislation. At Crêperie Lemoni food is bought daily at a food store and brought to the restaurant.

5.2.3 Food waste management incentives and sustainability practices

Poppy believes that it is important for restaurants to work sustainably and the reason they sort food waste is because of the environment. They use almost all of the food brought into the restaurant and have very little food waste as a result. Poppy does not consider food waste a problem in her restaurant since they only have a small amount of food waste, but says that by not wasting food you save resources. According to Poppy, the municipality has not informed or provided any advice on food waste management but representatives from the municipality visit the restaurant every year to make sure that they sort their food waste correctly. As well, she has not heard of or come across information on any of the food waste prevention or minimization efforts at the municipal, national or EU levels.

5.2.4 Food waste management initiatives and sustainability practices

Even though customers usually eat all of their food, every so often somebody does not finish their meal and they ask to take the leftovers home. Typically they request a doggy bag on their own, but if not, the staff will ask if they would like to take it home with them. As previously stated they try to use as much of the food ingredients as possible in their cooking so little food goes to waste. Neither the company website nor the social media accounts include any information about sustainability and food waste management practices or food waste prevention initiatives.

5.2.5 Training/communication

Poppy trains her staff in food management, food waste management as well as on how to minimize waste in the kitchen. She communicates to her staff about food waste but not to the customers.

5.2.6 Sources of food waste

According to Poppy the majority of the waste is customer plate waste. The rest of the waste is kitchen preparation waste and orders that are sent back to the kitchen.

5.2.7 Barriers and challenges in preventing and minimizing food waste

Although she does not see food waste as an issue in her restaurant, Poppy states that routines are important to keep food waste levels down. She goes on to say that they have enough experience to know how much food they should order in relation to a certain amount of expected orders. Poppy believes that food safety and hygiene regulation has an impact on food waste levels. She elaborates by stating that depending on how you plan your restaurant and store your food, you impact food waste levels. Since the food is cooked on demand, they are able to keep food waste levels down.

5.3 Max

5.3.1 Organizational Structure

Max is a Swedish family-owned hamburger chain that opened in 1968 (www, Max, 1, n.d.). Max is currently in Norway and Denmark as chain restaurants as well as in Abu Dhabi and Dubai where they operate as franchises. In total there are 102 Max restaurants employing approximately 3 500 people (*Ibid.*). In Uppsala there are four restaurants and the case study restaurant is located in Stora Torget, the city centre (www, Max, 2, n.d.). All of the information in the Max empirics is from the interview with Cecilia (Pers. Com., 2016), if not stated otherwise.

5.3.2 Restaurant food waste policy and practices

Food waste is sorted and put into biodegradable paper bags before it is taken out to the garbage room where it has a designated bin. Uppsala municipality picks up the food waste at least once a

week and it is paid for per pick-up. The frying oil is picked up by a separate company but the frequency of the pick-up varies. The estimated seven kilos a day of food waste is tracked in monetary terms and in relation to the net sales for the same time period.

There is no system in place to measure customer food waste and it is only sorted in the kitchen. Cecilia points out that customers throw away a lot of food, but she is unsure whether they would sort their waste properly if they would be given the chance to do so. In the restaurant dining area there are three garbage disposal units where customers are expected to separate their waste. The garbage disposal units sort liquids, soda cans, food boxes and general waste such as paper and food waste (Part. Obs., Max, 2016). In the kitchen, containers are strategically placed to facilitate the sorting of food waste in the kitchen (*Ibid.*). Municipal food inspectors visit once or twice a year to assure that health and hygiene practices are adequate but apart from that, Max has hired Anticimex to help ensure good routines and that food safety and health regulations are followed. Their feedback is usually about food practices and does not affect food waste amounts in the restaurant according to Cecilia. Food is not donated to any organizations as it is perceived to be a complicated procedure when the food is cooked and has to be handled in a safe way. Fresh and frozen food is delivered to Max three times a week.

5.3.3 Food waste management incentives and sustainability practices

Working sustainably is pointed out to be important and environmental thinking is a part of Max's company values. Cecilia points out that Max is a leader when it comes to environmental work and has received international recognition for it. "You feel proud to be working for a company that is doing good. Many might think badly about the fast-food business but I think that Max is a fantastic company" (Pers. Com., Cecilia, 2016). She also states that financial and sustainability aspects are benefits derived from lessening food waste. Cecilia is not familiar with any of the initiatives to lessen food waste in Sweden and in the EU.

5.3.4 Food waste management initiatives and sustainability practices

This specific restaurant has a goal to not waste food worth more than 0.8 percent of their total sales over a specific time period. At the time of the interview, food waste levels were 0.72 percent of total sales which satisfied the goal. In her experience there have been no changes in the food waste practices and they have had the maximum limit of 0.8 percent since she started as restaurant manager two years ago. The waste goal of less than 0.8 percent is communicated to all restaurant employees in the change room where a whiteboard is displayed and updated daily on all restaurant goals. If waste levels exceed 0.8, it is marked in red and this provides an incentive to Max employees to pay attention to the food waste levels. Regarding storage practices, they have not changed as their current practices work well.

Max has compensated for all of their products through carbon offsetting by planting trees in Africa. This is also stated on the website along with information about the different awards and the recognition they have received for their sustainability work (www, Max, 3, n.d.). The company website, Facebook, Twitter, and Instagram accounts provide information on sustainability programs which include the climate, environment, health, food and social responsibility (*Ibid.*). The website states, "To take responsibility for sustainable development is a long-term job that never ends. This is why sustainability is incorporated throughout our entire organization- from management and CEO to our 4000 employees- and we try to weigh in sustainability questions in all decisions" (*Ibid.*). The website explicitly states that they work to minimize food waste in their

restaurants and this is apparent with the goals of waste minimization (www, Max, 4, n.d.; Part. Obs., Max, 2016).

5.3.5 Training/communication

All new employees have four days of work training where they also complete a web-based educational program which possibly brings up food practices. Cecilia communicates to the staff about food waste and routines in the restaurant to avoid this type of waste. She offers examples such as organizing the refrigerators so food closer to the expiration date is used first. According to her the topic of food waste is almost always on the agenda and it is important for her to involve employees and engage them in food waste prevention and goals. One way of doing this is communicating the progress of the food waste goals on the white board in the employee change room (Part. Obs., Max, 2016). The decision to put up the board was made by the company and Cecilia supports the use of it and explains why the board is important. “I strongly believe that if my staff gets to take part in how it goes for the restaurant they will become more engaged” (Pers. Com., Cecilia, 2016). There is no information directed to customers about food waste in the restaurant, other than a small part on the website, to encourage them to throw away less food (Part. Obs., Max, 2016; Pers. Com., Cecilia, 2016; www, Max, 4, n.d.).

5.3.6 Sources of food waste

Cooked french fries, which amount to approximately 1.5 kilos a day, make up the bulk of the food waste in Max. To maintain the highest quality, the restaurant policy allows french fries to only stand for seven minutes, after that, they must be disposed of in the food waste bin. Other kitchen food waste is generated during food preparation. Foods such as tomatoes and already peeled onions, are delivered fresh, but need to be sliced in the kitchen. Salad is delivered fresh and precut and cheese is also precut. Foods, such as bread, meat and french fries, are delivered frozen and require little preparation when defrosted.

According to Cecilia, food expiration or best before dates are a source of food waste as well. The law requires a restaurant to discard any food items that have passed the expiration date. During the participatory observation of the kitchen facilities, an employee was tasked with discarding bags of expired lettuce (Part. Obs., Max, 2016). Cecilia adds that if the food item is past its best-before date it is not safe to serve and they therefore have to throw it as waste even if it looks and smells fine. She explains that customers throw away a lot of food, but the customer food waste is not included in the food waste amounts from the kitchen and as a result, she does not know how much food customers dispose. At times, demand forecasting or planning causes food waste. If too much food is prepared, and the forecasting of the daily expected number of customers is lower, it requires discarding that food. Too much ordering of food could also result in throwing away avoidable food items. This is why it is important to have experienced staff familiar with routines and knowledge of how much food to prepare based on the daily expected customer amounts.

5.3.7 Barriers and challenges in preventing and minimizing food waste

According to Cecilia it is not difficult to manage food waste as Max has good routines and food waste is not an issue. Even though food waste is not an issue, it is still a challenge to maintain good routines and experienced staff to prevent or minimize food waste. The staff turnover is high at Max; every year approximately twenty new employees require training and education to learn routines and food waste practices which results in a demanding training schedule for Cecilia.

5.4 Zocalo

5.4.1 Organizational Structure

Zocalo is a Mexican food restaurant chain with six locations in Sweden (www, Zocalo, 1, n.d.). Simeon has worked as the manager of the Uppsala location since its opening four years ago. The centrally located restaurant shares space in a food shopping centre along with a grocery store, and other restaurants and cafes. All of the information in the Zocalo empirics is from the interview with Simeon (Pers. Com., 2016), if not stated otherwise.

5.4.2 Restaurant food waste policy and practices

The restaurant orders food three times a week. This results in small orders, but the fresh food is then used up within two days of the delivery. This system helps eliminate ordering too much food, which has a higher possibility to go bad. While the website boasts food cooked from scratch (www, Zocalo, 1, n.d.), and some fruits and vegetables are delivered fresh, much of the food, such as meat, tomatoes, corn, cheese, and tortilla bread, is pre-prepared and delivered frozen to the restaurant and is kept frozen until it is defrosted and used (Part. Obs., Zocalo, 2016). Simeon estimates that approximately three to five kilos of food waste is generated each week. The three to five kilos is already separated in the kitchen and brought out to a larger food waste bin which is shared with other restaurants in the food shopping centre. Uppsala municipality collects the food waste and the landlord of the location is billed and the cost for Zocalo's food waste is included in the rent. Customer plate waste or drinks are not included in the three to five kilos of food waste as customers discard their own uneaten food and the garbage is then taken to the garbage bin intended for incineration and leftover drinks are discarded down the drain. The garbage disposal units that customers use to discard their waste is divided into food waste, paper, and utensils – which are washed in the kitchen and reused. The customer paper and food waste garbage are separated in the garbage disposal unit, but both are put into same waste bin for incineration (*Ibid.*).

5.4.3 Food waste management incentives and sustainability practices

There are several sources and reasons why food waste and sustainability practices are implemented or at least discussed within Zocalo. When discussing incentives for minimizing or preventing food waste and general sustainability practices, Simeon brings up financial, environmental, and social or ethical reasons. The restaurant strives to offer ecological and environmentally conscious food and this was brought up both in the interview as well as on the website, Facebook, Twitter, and Instagram accounts, but none mention food waste as a part of sustainability practices. It is important to minimize food waste as it affects the company financially and according to Simeon (Pers. Com., 2016), “food is money...no one is interested in throwing away food.” He also discusses the ‘feel good’ factor of not throwing away food and that it is unethical to do so when people are starving in other parts of the world.

Municipal food inspection agents visit once a year and two years ago, they demanded that Zocalo start separating their food waste from other waste. This provided an incentive as they would have otherwise been fined if they had not complied with the food inspection agent. Information about food waste in the news and programs in France and Denmark have provoked thought about food waste but no changes have come about in the Uppsala location since there is so little food waste generated in the kitchen. “Our routines are in good shape and we are not doing anything unnecessary” (*Ibid.*). Customers provide another incentive for sustainability practices as they are concerned about the source of the food products. Simeon has not heard of or come across

information on any of the food waste prevention or minimization efforts at the municipal, national or EU levels.

5.4.4 Food waste management initiatives and sustainability practices

There are no programs or policies specifically directed at food waste in Zocalo at a corporate or restaurant level, but there are efforts and discussions surrounding this issue. The website lists other environmental initiatives such as working with environmentally responsible suppliers, using wind powered electricity at all the locations, purchasing as many organic products as possible, reducing emissions, and focusing on selling more vegetarian and vegan dishes, but has no mention of food waste concerns or initiatives (www, Zocalo, 2, n.d.). There has been discussion in the company as to what to do with customer food waste, but nothing has been acted on as of yet. Customers have been pushing for and expecting sustainability practices and some even ask for take-out containers or doggy bags if they are not able to finish their food. This is asked for a few times per week, but in Simeon's view, in other cultures such as the United States of America (USA), doggy bags are much more common. Some leftover prepared food from the kitchen is taken home by employees. For example, "guacamole has to be made fresh everyday so we often have some leftover" (Pers. Com., Simeon, 2016). Usually, Zocalo has very little leftover, unused food, so for this reason, Simeon says, they do not donate food. A while ago, the landlord of the restaurant building approached Simeon and discussed starting a program to collect leftover food from the food shopping centre restaurants for donation. Simeon let him know that he would be willing to purchase extra food in order to be able to contribute to the cause, since the kitchen has no extra food to provide. According to Simeon (*Ibid.*), the restaurant has very little food that goes bad due to the way the restaurant operates "it makes it easy for us to not throw anything away."

5.4.5 Training/communication

The restaurant has no specific training on food waste or ways to prevent or minimize food waste. All employees are trained when they begin employment and are trained on routines and this includes minimizing food waste. According to Simeon, if he notices an employee cutting off too much of the edible parts of food, he will inform them and ask them to use as much of the food product as possible.

5.4.6 Sources of food waste

Most food waste in Zocalo is unavoidable and is generated in the kitchen as preparation waste and consists of peels and cores from pineapple, cabbage, peppers, burnt bread, and cucumbers. Sometimes a larger order will result in throwing away unused parts of food. For example, a larger than usual head of lettuce will be delivered and only 95 percent of it is used while five percent is discarded. There is some food waste from uneaten customer meals, but there is no record of this. At times, the cook will prepare the wrong meal for a customer and if the customer has touched this food, it must be discarded and is then included in the kitchen food waste bin.

5.4.7 Barriers and challenges in preventing and minimizing food waste

Simeon states that food waste is not a problem at Zocalo. It is easy to manage food waste in the kitchen as most of it is of the unavoidable type.

5.5 Summary of empirical results

In total, at least 15 food waste practices were uncovered during the course of the case studies and a list of these practices could be found in appendix 6. Some of the more significant food waste practices affecting food waste amounts, or ones which have changed in order to adapt to the environment are food delivery, storage, communication, doggy bags, and sorting practices. All of the restaurants are satisfied with their current delivery and storage practices and have no plans to change them. Food waste communication occurs continuously in all of the restaurants. The use of doggy bags is viewed positively by Shamal, Poppy, and Simeon and they encourage the use of them, even though they observe a resistance to use them. Due to the QSR service style, doggy bags are not needed in Max, for this reason, this practice was not discussed to extent with Cecilia. Sorting practices are observed and discussed in all of the case study restaurants.

Food waste is not considered an issue in Crêperie Lemoni, Max, and Zocalo, while in Basilico, it is considered an issue. Even though it is not perceived as an issue in three of the restaurants, all of the restaurants have incentives to manage and minimize food waste and incentives include social, economic, and environmental reasons.

It is apparent, although not always formally communicated through company policy, vision, mission, or goals, that all of the case study companies have some kind of policy or initiative regarding food waste. Company policy can be categorized into formal and informal policies. Formal policy is observed as the mandatory food waste training, concrete food waste goals, and complying with food hygiene and safety legislation. Informal policy could be categorized as the informal on-the-job food waste handling, communication, and training. The restaurants that have formal sustainability goals are corporate-owned while the restaurants without any formal sustainability goals are privately-owned.

The sources and amounts of food waste differ depending on the type of restaurant. In the QSRs, where they do not prepare all the food from fresh ingredients and much of the food is delivered pre-prepared and frozen, and customer plate waste is not sorted, preparation waste of the unavoidable type is the biggest source of food waste. In the FSRs, where all food is prepared using fresh ingredients and very little food is delivered frozen and pre-prepared, the biggest source of food waste comes from customer plate waste.

6 Analysis

In this chapter the empirical results are analyzed with the help of the conceptual framework presented in figure 6.

6.1 Conceptual Framework

It is impossible to understand the practices of an organization without looking at the factors which help develop them. The changing environment in which the case study restaurants exist, causes them to alter practices to adapt to the constantly developing socio-technical infrastructures. SPT helps understand changing food waste practices from a sustainability management and TBL perspective as well as how stakeholders influence practices. The food waste practices are studied with these concepts in mind to see evidence of these concepts in the restaurants. The goal is to observe which stakeholders affect food waste practices and if and how the restaurant incorporates sustainability management or the TBL in the company goals and culture and whether or not this culture of sustainability is reflected in the food waste practices. All three of these concepts and theories are first discussed in general in this section, but applied to specific practices in the analysis of SPT. Figure 6 shows the conceptual framework and relationship between the theories and concepts in the creation of the analytical tool.

6.2 Triple bottom line and food waste practices

The TBL concept reflects the sustainability of a company taking into account social, financial, and environmental aspects (Hall, 2011). The minimization or prevention of food waste in restaurants could benefit both the organization and society socially, environmentally, and financially. A part of this analysis is to uncover the aspects of the TBL that help or incentivize the prevention or minimization of food waste in restaurants. While the social and environmental aspects were mentioned by Simeon, Shamal, and Cecilia, the financial aspect is the biggest driving force for minimizing food waste. The social, environmental, and ethical aspects of food waste were mentioned by all respondents in the interviews and on the Zocalo and Max websites, but it is difficult to interpret how much of this aspect of TBL is the reason for changing practices to minimize or prevent food waste.

6.3 Stakeholder theory and food waste practices

Stakeholders influence food waste management in restaurants in different ways. The premise of the theory is that corporations and their actions effect people and institutions outside of the firm while people and institutions outside of the firm affect the goings on within the firm (Freeman, 1984). This is the perspective to be applied to food waste practices within restaurants in this analysis. At a societal level food waste practices benefit or damage society financially, socially, and environmentally, while the practices within restaurants are influenced by stakeholders such as customers, employees, interest groups. The stakeholder theory is limited to the interests of human beings (Orts & Strudler, 2002) but what needs to be considered is the environment as an influencing factor. The main stakeholders affecting food waste practices in all four case study restaurants are managers and owners, as well as the municipal level government. Affecting these stakeholders and their creation of new practices, is society as a whole and the constant evolution of practices. The managers implement and enforce the new practices. The municipal government enforces the

practices of sorting food waste by fining the restaurants for poor sorting practices. Customers affect food waste practices by requesting doggy bags as observed in Basilico and Zocalo.

6.4 Sustainability management and food waste practices

One of the major influences of food waste practices within restaurants is management plans and operations of the company mission, vision, and culture. What is important in the analysis of management plans for sustainability and food waste goals and culture, is the communication through company documents as well as through the managers and owners to employees. What is also important in sustainability management is what the restaurant has done to go beyond what is legally expected of them in their operations. Creating a sustainable culture concerned with food waste is observed in the case study restaurants in both formal and informal communication and policy. Formal communication or policy is apparent in Max where the company, as seen from their website and social media sites, has taken an active role in voluntarily incorporating environmental and social responsibility into the restaurant. The website explicitly outlines sustainability intentions and goals and even mentions food waste. This culture or incorporation of sustainability is seen in the practices discussed with Cecilia during the interview. The environmentally, and socially conscious company has instilled these values into the manager as well as the food waste practices. This is also observed in Zocalo, where the company website communicates formal sustainability goals and the ecological foods served on the menu. These company values are discussed by Simeon as well, but only carried out informally. In Basilico and Crêperie Lemoni, there is no formal discussion of sustainability or food waste on the website nor on the social media sites. Within the restaurants, sustainability management is informally incorporated through conversation and interaction.

6.5 Social practice theory and food waste practices

Practices depend on current institutions, culture, history, traditions and social constructions (Warde, 2005). For this reason, SPT focuses on the actions of individuals, with an understanding that practices are continuously developing and formed by the context and infrastructure they exist in (Nicolini, 2012). These changing practices are implemented by and affect external and internal stakeholders (Warde, 2005). In order for a practice to exist, the three elements, materials, competence, and meanings, need to be present and linked as seen in figure 5 (Shove *et al.*, 2012).

Various food waste minimization or prevention and sorting practices are identified in the study. At least 15 different food waste practices (see appendix 6) were uncovered in the four case studies, but only five – food delivery, storage, food waste communication, doggy bags and sorting practices – are interpreted in this analysis. These practices are discussed in existing literature and for that reason the same ones are selected for this analysis. They are also practices that are perceived to have a greater impact on food waste amounts in restaurants. On top of this, during the research process, these practices were observed to have changed the most over time are therefore interesting to discuss from a SPT perspective. The four practices will be analyzed using the three elements.

6.5.1 Materials

In order for a practice to be carried out, materials and/or infrastructure are needed to do so (Spurling *et al.*, 2013). Not only should the materials be provided for the practice to be effectively carried out, but they should be convenient and easily accessible as well (McKenzie-Mohr & Schultz, 2014). The chosen five practices require certain materials and infrastructure in order for the practices to be carried out and are described in the following sections.

Food delivery practices

In order for food to be delivered to the restaurant, food delivery infrastructure is required. In the past, fresh food was delivered three times a week which resulted in larger amounts of fresh food going bad, so Shamal decided to change food delivery practices from three times a week to daily in order to minimize food waste. To make this change happen, delivery schedules, employees, trucks, food suppliers, and any other stakeholders or aspects that affected the delivery infrastructure of Basilico, had to be reorganized. If these infrastructure aspects were not available or successful, the changed food delivery practices would not exist. Even though they have not changed food delivery practices, the other three case study restaurants have delivery infrastructure that suits their needs.

Food storage practices

Restaurant food storage practices require specific materials such as cupboard and shelf space, and space and electricity for refrigerators and freezers. When asked, all the respondents replied that they are satisfied with their current storage practices, but several years previously, Shamal at Basilico changed his restaurant food storage practices. In order to reduce food waste, Shamal (Pers. Com., 2016) got rid of three refrigerators and one freezer to make it difficult for employees to order large volumes of food, as it would often end up going bad before being used. To change this practice, it required him to change the availability of materials such as refrigerator and freezer space. The other restaurants have the necessary materials to carry out their storage practices.

Food waste communication practices

For food waste communication practices to be carried out, the materials and infrastructure, such as employees, managers, message boards, websites, and social media outlets are needed. Employees and managers become information channels to share knowledge, train, educate and communicate food waste practices. Social interaction between the interviewed managers and restaurant owners and their staff is necessary when providing food waste training and education. Formal training in food waste practices is provided by the case study respondents (Pers. Com., Cecilia, Shamal, Simeon, Poppy, 2016). Shamal, Cecilia, and Simeon (Pers. Com., 2016) all train their staff informally as well, using daily communication over the course of the working day, which is convenient as the training is relatively spontaneous. This goes in line with the notion that materials should preferably be easily accessible and convenient (McKenzie-Mohr & Schultz, 2014). Cecilia, at Max, has secured a white board, as a material, to communicate food waste goals along with other goals of the restaurant.

Communication is also done through the use of websites and social media such as Facebook, Twitter, and Instagram. Food waste communication is enabled through these channels when the restaurant creates or builds the website or social media accounts. The creation of the webpage or social media communication channels provides the necessary materialistic element and infrastructure to enable this practice of communication (Shove *et al.*, 2012). While all the case study restaurants own websites and hold social media accounts, Max is the only restaurant to communicate food waste goals on their website where they state that they work to lessen food waste in their company (www, Max, 4, n.d.).

Doggy bag practices

By offering doggy bags to customers, restaurants are providing a necessary material element to encourage the practice of using doggy bags which helps to minimize and prevent food waste. Basilico, Zocalo as well as Crêperie Lemoni engage in doggy bag practices (Pers. Com., Shamal, Simeon, Poppy, 2016). The practice of providing doggy bags is enabled by providing employees access to the bags which are then offered to the customers. Doggy bags are a convenient solution to plate waste for the restaurants, and customers are able to take home food that normally would have been discarded by the restaurants. Without the material element of the doggy bag being available, this would be not possible.

Food waste sorting practices

Food waste sorting is an example of a practice that requires materials and infrastructure to be carried out. The restaurants sort their food waste into separate bins which are picked up by the municipality (Pers. Com., Shamal, Poppy, Cecilia, Simeon, 2016). The food waste bins, as well as the pick-up service are examples of materials and infrastructure necessary for the practice of food sorting. The materials and infrastructure provided by the municipality are convenient and aid in the adoption of the food waste sorting practice in the restaurants.

6.5.2 Competence

The second element contributes with the know-how that is necessary to carry out a specific practice (Shove *et al.*, 2012; Spotswood *et al.*, 2015; Rettie *et al.*, 2012). The know-how can be a skill required for the practice, through training or experience, but it could also be the acquired understanding of what is considered a desired behaviour or expected behavior in a specific context or situation (Shove *et al.*, 2012). Since practices are constantly changing and/or being reproduced, the know-how of a practice needs to be maintained and reproduced in order for the practice to be performed successfully (*Ibid.*). The competences necessary for the five practices are analyzed in the following sections.

Food delivery practices

For food delivery practices to exist, the know-how and competence, on top of materials, as explained earlier, are necessary. Knowledge about food delivery systems, stakeholders, and schedules, are examples of some of the aspects needed in order to successfully execute food delivery practices. At Basilico, Shamal made the realization that by changing food delivery from three times per week to daily, he would be able to lower food waste amounts. In order to do so, required him to have the competence to foresee the benefits from the change, and the know-how in implementing infrastructural change. He had to know who to contact, what to change, and who it would affect. The restaurants in the case studies require employees to know delivery schedules, how to receive deliveries, place orders, and who the stakeholders are in the delivery process.

Food storage practices

Knowing how to store food is important in order to save on food waste (WRAP, 2011a). The element of competence manifests itself in the understanding of what is considered desirable food storing practices. Food hygiene and safety, legislation, storage spaces at the location, how much storage space is needed, and heating and cooling systems are some examples of know-how needed to carry out storage practices. Shamal understands the importance of storing food in order to maintain the safety, hygiene and quality of food. The change in delivery practices helped him realize that the restaurant did not require all of the freezers and refrigerators. This exemplifies a continuously changing practice. With new acquired knowledge and know-how, practices change.

Competence is also gained through formal and informal training and all the case study restaurants use training and education in order for employees to carry out food storage practices.

Food waste communication practices

In all of the restaurants, staff receive training to minimize food waste during food preparation (Pers. Com., Shamal, Poppy, Cecilia, Simeon, 2016). To maintain food waste minimization practices, the understanding of the practice and practical knowledge has to be shared with staff members (Shove *et al.*, 2012). The sharing of information is the communication practice. In the case study restaurants, food waste practices are communicated through information boards, and verbally. To communicate about food waste practices requires competence and knowledge of the issue within the restaurant and this knowledge is shared so employees will follow the desired food waste practices. Although necessary, training and maintaining the know-how of employees is something that Cecilia (Pers. Com., 2016) points out as a challenge. Another example from the empirics is Shamal's use of his knowledge in preparing bouillon from meat and vegetables, this knowledge is shared with employees and helps keep food waste levels down.

Doggy bag practices

Knowledge and competence of doggy bags are necessary before this practice is adopted. It is important for both customers and employees to know of doggy bags and their use in order for the practice to be successful. At Basilico, Crêperie Lemoni and Zocalo the managers understand that providing doggy bags can help minimize food waste (Pers. Com., Shamal, Poppy, Simeon, 2016). This knowledge is key in order for them to provide doggy bags at the restaurants and Shamal has given instructions for employees to offer doggy bags to customers. In a culture, such as Sweden, where doggy bags are not commonly used, Shamal and Simeon have seen resistance from customers in accepting doggy bags. The challenge lies in making the practice of doggy bags acceptable, and a desired behaviour.

Food waste sorting practices

The necessary competence and know-how for sorting food waste is provided to all employees in the case study restaurants (Pers. Com., Shamal, Poppy, Cecilia, Simeon, 2016). The food waste sorting practices are adopted from the municipally mandated law that all restaurants must sort food waste. Due to this, the competence and know-how are filtered down from the municipality to restaurant owners, managers, and employees, which then becomes a shared understanding of an expected behaviour in the restaurants. What is allowed in the food waste bins, and where and at what time the food waste bin is collected are examples of competence and know-how needed for sorting practices.

6.5.3 Meanings

The third element of a practice is the meanings which are the emotional and motivational incentives attached to a practice (Shove *et al.*, 2012). This element also captures the shared acceptability of a practice in a setting or context (Shove *et al.*, 2012; Spotswood *et al.*, 2015; Rettie *et al.*, 2012). It is complicated to uncover the motivating factors attached to specific practices. Overall, the interview respondents expressed awareness of the financial, environmental, and social consequences of food waste issues. All respondents stated financial incentives as motivating factors in attempts to prevent food waste as the restaurant did not have purchase so much food as a result. Simeon (Pers. Com., 2016) is quoted as saying, "food is money, and nobody is interested in throwing away food." The environmental and social aspects as motivational incentives are more general and difficult to attach to one specific practice. Simeon also discusses the 'feel good' factor in food minimization or prevention and the ethics of throwing away food when other nations

experience starvation (Pers. Com., Simeon, 2016). Cecilia states that the financial and sustainability aspects are benefits derived from lessening food waste (Pers. Com., Cecilia, 2016). The Max website states that food waste minimization is a part of continuous environmental work which is one of the values of the company (www, Max, 4, n.d.). Even though these statements show a concern for the environment and sustainability, how these are carried out in the practices is less unclear. This may in part be due to the fact that financial aspects are measurable. For example, when a restaurant has environmental and social values, such as Max, their food waste goals are measured in terms relative to net sales. It could be argued that the goals are financially motivated, but the financial motivation satisfies an environmental or social value. With this mind, the meanings attached to the five practices are analyzed in the next sections.

Food delivery practices

The motivational incentive for adopting and adapting delivery practices could be attributed mainly to financial motivation, as discovered in Basilico, Max, and Zocalo. Shamal changed his delivery schedule in order to minimize waste. This required changing to smaller, more frequent and expensive deliveries, but saved on storage and less edible food going to waste.

Food storage practices

Financial incentives are also the motivating factors in food storage practices. Shamal (Pers. Com., 2016) got rid of one refrigerator and three freezers to help cut down on over ordering of food and as a result, the company saved 30 percent on food costs. A social motivation in food storage practices mentioned by Simeon, is practiced by sending uneaten food home with employees rather than discard it, so the food does not go to waste.

Food waste communication practices

A part of the meanings is to have a shared understanding within a group about a practice (Shove *et al.*, 2012). Due to this, food waste communication practices are motivated by a need to share information and normalize the routines and make them socially acceptable. Cecilia shares her knowledge of food waste goals with employees in an attempt to involve them in the sustainability culture of Max. It is explicitly stated on the Max (www, Max, 4, n.d.) website that they work to lessen food waste, which signals to customers that they recognize and share the understanding that practices to minimize food waste are important.

Doggy bag practices

Doggy bag practices are motivated by a desire to normalize this behaviour. Even though doggy bags are not common, Shamal and his employees are attempting to change this cultural norm by offering doggy bags to customers to make this practice socially acceptable.

Food waste sorting practices

The motivations behind food waste sorting practices are grounded in financial, environmental, and social reasons. Poppy at Crêperie Lemoni states that the reason the sorting practice exists is because of a desire to operate sustainably. Shamal offers a financial reason behind Basilico's sorting practices. He states that if they do not sort, the restaurant will be fined 900 SEK. Two years ago, food inspector agents demanded that Zocalo adopt food sorting practices. While Simeon did not state the repercussions if this practice was not adopted, he conveys that he did not have a choice but to start sorting food waste. This is an example of a changed practice due to a change in the meaning attached to it. The municipality provided a new meaning and motivation for Zocalo to adopt the food sorting practice, by making it mandatory.

7 Discussion

This chapter addresses the research question presented in chapter one. It also discusses the findings and analysis in relation to other studies related to restaurant food waste.

The analysis, with the help of SPT, and from the perspectives of TBL, sustainability management and stakeholder theory uncovered several influencing factors in food waste practices in restaurants. This study looked at practices in general, both at the practices that caused food waste, as well as the practices that prevented and minimized food waste. There are several significant findings that will be discussed in the following sections. The research question from chapter one is:

What influences food waste practices in restaurants?

The analysis helped uncover the factors that influence food waste practices in restaurants. Using other related studies, the important findings that answer the research question are discussed below.

7.1 Restaurant types

The type of restaurant is a significant influencing factor in food waste practices. The type of restaurant affects how food is handled, processed, and at which stage the food waste is generated within the restaurant, as well as how much food is wasted. Although she did not go into deeper detail on this issue, in her article, Schneider (2013b, 199) states that “many assumptions have to be made when estimating waste from different types of restaurants.” This is the same issue uncovered in this study, where the type of restaurant has a strong influence in how much food is wasted and whether food waste is considered an issue or not. Much of the literature and statistical figures discuss restaurants and food waste, but do not distinguish between the different types, other than comparing for-profit restaurants and the cost sector (Silvennoinen *et al.*, 2015; Engström & Carlsson-Kanyama, 2004; Garrone *et al.*, 2014). These studies recognize that the two types differ based on cooking activities, service and customer experience, but what they fail to do is define or describe the differences in the for-profit restaurants.

There are three sources in the literature used in this study that differentiate between for-profit restaurants, these are the WRAP (2011a), WRAP (2013), and the NCM (2012). The terms the WRAP reports use are restaurant, QSR, pub, and hotel and the NCM report uses the terms restaurant and fast food. Even though they specify the type of restaurant, they still compare the amounts of food waste in each type, which does not take into account the very different food handling practices and systems. By studying the practices in our research project, we were able to uncover this issue. The WRAP (2013) study does mention that restaurants generate more preparation and kitchen waste and that QSR preparation and kitchen waste is generated further up the supply chain. Even with this acknowledgement, they do not expand further on this and they fail to mention the practice of customer plate waste disposal which in our study caused a major difference in the food waste amounts generated within the restaurant.

Through the analysis of food waste practices in the four restaurants in our study, it is evident that it is important to distinguish between the different types of for-profit restaurants, as their systems and operations determine their food waste practices. Within the FSRs, most food is delivered raw or fresh and prepared in the restaurant kitchen, while in the QSR, the majority of the food, other than fresh vegetables and fruit, is delivered pre-prepared and frozen. This means that preparation/kitchen waste, which is usually unavoidable food waste, is generated at a different facility and stage of the food supply chain and is not included in the restaurants food waste amounts.

On top of this, the QSR restaurants do not dispose of customer plate waste, which is usually avoidable food waste, in their kitchen food waste bin. This means that the restaurant does not know how much food waste is generated by leftover customer plate waste. Both managers at the QSR restaurants maintain that food waste is not a problem in their restaurant, and the fact that they prepare very little food themselves, as well as not observing or including customer plate waste are large factors for this. It does not mean that the QSR restaurants generate less food waste, it means that the food waste is simply generated at a different stage of the food supply chain.

7.2 Sources of food waste

The practices and routines of FSR and QSR style restaurants vary and this determines at which stage or practice and how much food is wasted. The findings show that both types have food waste, but the sources and amounts of food waste generated at the locations vary greatly.

Within the FSRs, Basilico and Crêperie Lemoni, customer plate waste is the main source of food waste. Similar findings in research are found in Silvennoinen's *et al.* (2015) study of food waste from restaurants and diners, where customer plate waste is the biggest source. The study by Engström and Carlsson-Kanyama (2004), and Katajajuuri *et al.* (2014), also found that plate waste is the largest source of food waste in restaurants. The findings do not coincide with the WRAP (2013, 27) study which found that of the food wasted in restaurants, 45 percent came from food preparation or kitchen waste while 34 percent came from customer plate waste. It is difficult to determine what these figures contain, as the report offers these percentages but does not provide any details about restaurant type.

Max and Zocalo, as QSR's, have a different restaurant system altogether. The customer plate waste is not included in the overall food waste amounts, as it is in Basilico and Crêperie Lemoni. Max and Zocalo experience the main source of food waste to be serving and preparation waste, which is mostly unavoidable food waste. There is no data or literature found specifically about QSRs and their main source of food waste.

7.3 Doggy bag practices

The main source of food waste in FSRs, in our study, is customer plate waste. Surprisingly little information is found on the practice of doggy bags in the literature. Of all of the articles and sources used in this thesis, only four sources discuss doggy bags as one solution to minimizing food waste. Aschemann-Witzel *et al.* (2015), WRAP (2013), European Commission (2010), and the NCM (2012) reports discuss the social norms and acceptance of this practice. The NCM (2012) report discusses the reluctance of the Nordic cultures to adopt doggy bag practices. Like the reports, Shamal from Basilico as well as Simeon from Zocalo discuss the reluctance and embarrassment of some customers in using doggy bags. The social norms in the culture prevent doggy bags to be used regularly. In the analysis of food waste practices using SPT, it is crucial to change the meanings of a practice in order for it to become normal or routine (Shove *et al.*, 2012). In this case study, it is discovered that Basilico, Crêperie Lemoni, and Zocalo are trying to change the meaning or negative reactions to doggy bags. With more attention given to food waste and the negative environmental, economic, and social effects, coupled with restaurant management persuasion and persistence, perhaps doggy bags will become a fully accepted practice in Sweden.

7.4 Food waste sorting vs food waste minimization and prevention

The final finding in this research is that of all the efforts to minimize and prevent food waste, no program, at the municipal, federal or EU level has been directed at the restaurants in the study. The food waste practices mandated by the municipal government focused on food sorting practices and not waste prevention. This shows a compliance with the WFD hierarchy in figure 2, but does not fulfill the main priority of prevention, rather it fulfills the fourth priority of energy recovery. As discussed in chapter one, the biological treatment of food waste is not the optimal solution, as it is costly, and could prove to be a disincentive to the primary goal of the WFD hierarchy of prevention. The sorting of food waste in Uppsala municipality is enforced in the restaurants, but if policy makers want to ensure that the WFD main goal of prevention of waste is effective, they need to revisit the priorities in the hierarchy.

This finding in this research study is similar to the finding in the NCM (2012) report which found that a number of organizations stated that focus is given to sorting and not enough food waste preventative measures. We found no evidence of any policy, regulation, or legislation encouraging the prevention of food waste in the case study restaurants.

8 Conclusions

This chapter addresses the aim of the study, presented in chapter one. It also provides suggestions for future research ideas uncovered during the process of the research project.

The social, economic, and environmental implications, in combination with a growing global population, makes the food waste issue more important now than ever. The many efforts and initiatives made at an EU and Swedish national level to prevent food waste show it is a problem and is highly prioritized on the political agenda. Restaurants contribute to the total food waste amounts within Sweden and require efforts to minimize food waste. To effectively tackle the problem with food waste, behaviours and practices need to change and be replaced with new practices that promote efficient food consumption and handling. This report contributes to the discussion with a focus on restaurant food waste practices and the aim of this research project is restated below:

The aim of this study is to investigate food waste practices in restaurants, within one municipality, during a time of awareness and efforts to change and address the food waste issue.

In order to understand food waste practices in restaurants the stakeholders, the socio-technical structures and environmental contexts need to be considered. To aid in this the SPT looks at why people do what they do as it takes into account the context, culture, and history and is used to analyze the food waste practices. To reach specific food waste reduction government goals it is necessary to investigate food waste practices from an environmental and sustainability perspective. For this reason the context and culture, a necessary part of the SPT, are viewed from a TBL and sustainability management perspective.

This study has revealed food waste practices differ depending on the type of restaurant and the type of restaurant affects the sources of food waste. On top of this the use of doggy bags, to help minimize plate waste, is met with a cultural barrier and a reluctance from customers to adopt this practice. Furthermore there are no governmental programs to prevent food waste generation but only evidence of food sorting initiatives and this has greatly impacted food waste practices. This finding is important for policy makers because if SEPA intends to target restaurant food waste in their goal to reduce food waste in Sweden by 20 percent by 2020 (SEPA, 2013, 5), they will have to provide restaurants with the materials, meanings and competences to do so.

Future research suggestions

This study has revealed important findings and opened up many opportunities in the field of restaurant food waste research. Drawing upon one of the findings in this report, food waste practices depend on restaurant type and future research could focus on the practices, amounts, causes, and preventative food waste measures in a specific type of restaurant, such as a QSR or FSR. This will provide more accurate findings and information to help understand the food waste issue in restaurants.

More research is needed on QSRs as much of their food is pre-prepared and frozen, which means that much of the preparation waste ends up in different parts of the food supply chain. Customer waste is not sorted, so there is no data on customer plate waste from QSRs, even though customer plate waste is reported to be the biggest source of food waste in restaurants (Engström & Carlsson-Kanyama, 2004; Katajajuuri *et al.*, 2014).

Bibliography

Literature and Publications

- Ackoff, R.L., (1974). *Redesigning the Future: A Systems Approach to Societal Problems*. New York: Wiley.
- Ajzen, I., (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2): 179-211.
- Aschemann-Witzel, J., de Hooge, I., Amani, P., Bech-Larsen, T., and Oostindjer, M., (2015). Consumer-related food waste: Causes and potential for action. *Sustainability*, 7: 6457-6477.
- Avfall Sverige (2014). Swedish Waste Management. Available at: http://www.avfallsverige.se/fileadmin/uploads/Rapporter/sah_2014_Eng_141001.pdf [Accessed February 2, 2016].
- Baraban, R.S., and Durocher, J.F., (2010). *Successful Restaurant Design*. New Jersey, USA: John Wiley & Sons.
- Beretta, C., Stoessel, F., Baier, U., and Hellweg, S., (2013). Quantifying food losses and the potential for reduction in Switzerland. *Waste Management*, 33: 764-773.
- Bernstad Saraiva Schott, A., and Andersson, T., (2015). Food waste minimization from a life-cycle perspective. *Journal of Environmental Management*, 147: 219-226.
- Brundtland G. H., (1987). *Our Common Future: Report of the World Commission on environment and development UN, World Commission on Environment and Development/WCED*. Available at: <http://www.un-documents.net/ocf-02.htm#I> [Accessed July 8, 2016].
- Bryman, A., (2012). *Social Research Methods (4th ed.)*. London, UK: Oxford University Press.
- Creswell, J. W., (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (4th ed.)*. London, UK: Sage Publications Inc.
- Diener, E., and Crandall, R., (1978). *Ethics in Social and Behavioral Research*. Chicago, USA: University of Chicago Press.
- Donaldson, T., and Preston, L.E., (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review*, 20(1): 65-91.
- Edmondson, A. C., and McManus, S. E., (2007). Methodological fit in management field research. *Academy of Management Review*, 32(4): 115-1179.
- Eisenhardt, K.M., (1989). Building theory from case study research. *The Academy of Management Review*, 14(4): 532-550.

- Elkington, J., (2004). Enter the triple bottom line 1-16, (Editors) Henriques, A., and Richardson, J., *The Triple Bottom Line: Does it all add up?* London, UK: Earthscan.
- Engström, R., and Carlsson-Kanyama, A., (2004). Food losses in food service institutions: Examples from Sweden. *Food Policy*, 29: 203-213.
- European Commission (2010). *Preparatory Study on Food Waste Across EU 27*. Available at: http://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiwgIzc_LHMAhXJDiwKHdvpCfwQFggeMAA&url=http%3A%2F%2Fec.europa.eu%2Fenvironment%2Ffeussd%2Fpdf%2Fbio_foodwaste_report.pdf&usg=AFQjCNHJQyNq6OegT79dRHIMiy4fF5_CGA [Accessed February 20, 2016].
- European Commission (2011). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Roadmap to a Resource Efficient Europe*. Report - Brussels. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN> [Accessed February 2, 2016].
- European Commission (2012). *Preparing a Waste Prevention Programme: Guidance Document*. Available at: <http://ec.europa.eu/environment/waste/prevention/pdf/Waste%20prevention%20guidelines.pdf> [Accessed March 27, 2016].
- European Commission (2015). *Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the Loop – An EU Action Plan for the Circular Economy*. Brussels. Available at: http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF [Accessed April, 28, 2016].
- Evans, T. D., Andersson, P., Wievegg, Å., and Carlsson, I., (2010). Surahammar: A case study of the impacts of installing food waste disposers in 50% of households. *Water and Environment Journal*, 24: 309-319.
- FAO (2011). *Global Food Losses and Food Waste - Extent, Causes and Prevention* (Study Conducted for the International Congress SAVE FOOD; FAO; Dusseldorf, Germany). Available at: www.fao.org/docrep/014/mb060e/mb060e00.pdf [Accessed January 29, 2016].
- FAO (2013). *Food Wastage Footprint: Impacts on Natural Resources* (Summary Report). Available at: <http://www.fao.org/docrep/018/i3347e/i3347e.pdf>. [Accessed February 10, 2016].
- Freeman, R.E., (1984). *Strategic management: A stakeholder approach*. Boston: Pitman Publishing.

- Fusions (2015). *Review of EU Legislation and Policies With Implications on Food Waste*. Available at: <http://www.eu-fusions.org/index.php/download?download=161:review-of-eu-legislation-and-policies-with-implications-on-food-waste> [Accessed January 26, 2016].
- Fusions (2016). *Estimates of European Food Waste Levels*. Available at: <http://www.eu-fusions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf> [Accessed July 1, 2016].
- Garrone, P., Melacini, M., and Perego, A., (2014). Opening the black box of food waste reduction. *Food Policy*, 46: 129-139.
- Gibbs, H.K., Ruesch, A.S., Achard, F., Clayton, M.K., Holmgren, P., Ramankutty, N., and Foley, J.A., (2010). Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s. *Proceedings of the National Academy of Sciences of the United States of America*, 107(38): 16732-16737.
- Gjerris, M., and Gaiani, S., (2013). Household food waste in Nordic countries: Estimations and ethical implications. *Etikk I praksis. Nordic Journal of Applied Ethics*, 7(1): 6-23.
- Glaser, B., and Strauss, A., (1967). *The Discovery of Grounded Theory: Strategies of Qualitative Research*. London, UK: Wiedenfeld and Nicholson.
- Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., Pretty, J., Robinson, S., Thomas, S. M., and Toulmin, C., (2010). Food security: the challenge of feeding 9 billion people. *Science*, 327(5967): 812-818.
- Griffin, J. J., and Mahon, J. F., (1997). The corporate social performance and corporate financial performance debate twenty-five years of incomparable research. *Business & Society*, 36(1): 5-31.
- Hall, T. J., (2011). The triple bottom line: what is it and how does it work? *Indiana Business Review*, 86(1): 4.
- Halloran, A., Clement, J., Kornum, N., Bucatariu, C., and Magid, J., (2014). Addressing food waste reduction in Denmark. *Food Policy*, 49: 294-301.
- Hertwich, E.G., and Peters, G.P., (2009). Carbon footprint of nations: A global, trade-linked analysis. *Environmental Science & Technology*, 43: 6414–6420.
- Hoekstra, A.Y., and Mekonnen, M.M., (2012). The water footprint of humanity. *Proceedings of the National Academy of Sciences of the United States of America*, 109(9): 3232-3237.
- Hörisch, J., Freeman, R. E., and Schaltegger, S., (2014). Applying stakeholder theory in sustainability management: Links, similarities, dissimilarities, and a conceptual framework. *Organization & Environment*, 27(4): 328-346.

- Kallbekken, S., and Sælen, H., (2013). ‘Nudging’ hotel guests to reduce food waste as a win-win environmental measure. *Economics Letters*, 119: 325–327.
- Katajajuuri, J.M., Silvennoinen, K., Hartikainen, H., Heikkilä, L., and Reinikainen, A., (2014). Food waste in the Finnish food chain. *Journal of Cleaner Production*, 73: 322-329.
- Kirk, J., and Miller, M. L., (1986). *Reliability and Validity in Qualitative Research*. London, UK: Sage Publications Inc.
- Leal Filho, W., and Kovaleva, M., (2015). *Food Waste and Sustainable Food Waste Management in the Baltic Sea Region*. London, UK: Springer International Publishing.
- Legislative Council Secretariat (2014). *Waste Management Policy in Sweden* (Report). Available at:
<http://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&cad=rja&uact=8&ved=0ahUKEwj585XKx7HMAhVEICwKHZpNBUkQFghHMAc&url=http%3A%2F%2Fwww.legco.gov.hk%2Fyr13-14%2Fenglish%2Fsec%2Flibrary%2F1314in05-e.pdf&usq=AFQjCNFETFxh7DZguArE218Rwx1f2lhyWQ> [Accessed April 27, 2016].
- Livsmedelsverket (NFA) (n.d.). *Slutrapport- Regeringsuppdrag för minskat matsvinn 2013-2015*. Available at: http://www.livsmedelsverket.se/globalassets/matvanor-halsa-miljo/miljo/matsvinn/slutrapport-matsvinn_160321.pdf? t_id=1B2M2Y8AsgTpgAmY7PhCfg%3d%3d& t_q=Slutrapport-+Regeringsuppdrag+f%3%b6r+minskat+matsvinn+2013-2015& t_tags=language%3asv%2csiteid%3a67f9c486-281d-4765-ba72-ba3914739e3b& t_ip=130.238.116.175& t_hit.id=Livs_Common_Model_MediaTypes_DocumentFile/ 9c08a556-90a4-4fdf-a571-b4da308ced55& t_hit.pos=1 [Accessed June 28, 2016].
- Livsmedelsverket (NFA) (2016). *Mindre svinn-mer mat*. Available at: http://www.livsmedelsverket.se/globalassets/matvanor-halsa-miljo/miljo/faktablad_mindre_svinn_mer_mat.pdf [Accessed June 27, 2016].
- Lundqvist, J., de Fraiture, C., and Molden, D., (2008). *Saving water: From Field to Fork – Curbing Losses and Wastage in the Food Chain*. SIWI Policy Brief, SIWI. Available at: http://www.unwater.org/downloads/Paper_13_Field_to_Fork.pdf. [Accessed February 15, 2016].
- McKenzie-Mohr, D., and Schultz, P., W., (2014). Choosing effective behavior change tools. *Social Marketing Quarterly*, 20(1): 35-46.
- Morse, J. M., (1999). Myth #93: Reliability and validity are not relevant to qualitative inquiry. *Qualitative Health Research*, 9: 717-718.

- NFA (2014). *Swedish Strategies to Prevent Food Waste* (Presentation Document for Fusions, Brussels 31, October). Available at: <http://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&cad=rja&uact=8&ved=0ahUKEwjI2YyLp7HMAhWJiiwKHQ7wCfgQFggtMAM&url=http%3A%2F%2Fwww.eu-fusions.org%2Findex.php%2Fepm-2014%2Fcategory%2F19-consultation-session-quantification-guidelines-data-gathering-october-31-2014%3Fdownload%3D34%3Aingela-dahlin-livsmedelverket-swedish-national-food-agency-sweden&usg=AFQjCNGXxWF5x9c1WSCa-HyLw-UC15FprA> [Accessed April 28, 2016].
- Naturvårdsverket (SEPA) (2011). *Nyttan av att minska livsmedelssvinnet I hela kedjan*. Available at: <https://www.naturvardsverket.se/Documents/publikationer6400/978-91-620-6454-9.pdf> [Accessed June 7, 2016].
- Naturvårdsverket (SEPA) (2016). *Matavfall i Sverige – Uppkomst och behandling 2014*. Available at: <http://www.naturvardsverket.se/Documents/publikationer6400/978-91-620-8765-4.pdf?pid=18807> [Accessed July 11, 2016].
- Nicolini, D., (2012). *Practice Theory, Work, and Organization: An Introduction*. Oxford, UK: Oxford University Press.
- NCM (2012). *Prevention of Food Waste in Restaurants, Hotels, Canteens and Catering*. Available at: <http://infohouse.p2ric.org/ref/54/53132.pdf>. [Accessed February 2, 2016].
- Orts, E. W., and Strudler, A., (2002). The ethical and environmental limits of stakeholder theory. *Business Ethics Quarterly*, 12(02): 215-233.
- Parfitt, J., Barthel, M., and Macnaughton, S., (2010). Food waste within food supply chains: Euro Quantification and potential for change to 2050. *Philosophical Transactions of the Royal Society B*, 365: 3065-3081.
- Parmar, B. L., Freeman, R. E., Harrison, J. S., Wicks, A. C., Purnell, L., and De Colle, S., (2010). Stakeholder theory: The state of the art. *The Academy of Management Annals*, 4(1): 403-445.
- Parnell, J.A., (2008). Sustainable strategic management: Construct, parameters, research directions. *International Journal of Sustainable Strategic Management*, 1(1): 35–45.
- Porter, M., and Kramer, M., (2011). Creating shared value. *Harvard Business Review*, January-February: 1-17.
- Potter, J., and Hepburn, A., (2005). Qualitative interviews in psychology: Problems and possibilities. *Qualitative Research in Psychology*, 2: 281-307.
- Quested, T.E., Marsh, E., Stunell, D., and Parry, A.D., (2013). Spaghetti soup: The complex world of food waste behaviours. *Resources, Conservation and Recycling*, 79: 43-51.

- Reckwitz, A., (2002). Toward a theory of social practices: A development in culturalist theorizing. *European Journal of Social Theory*, 5(2): 243–263.
- Rettie, R., Burchell, K., and Riley, D., (2012). Normalising green behaviours: A new approach to sustainability marketing. *Journal of Marketing Management*, 28(3-4): 420-444.
- Riege, A. M., (2003). Validity and reliability tests in case study research: A literature review with “hands-on” applications for each research phase. *Qualitative Market Research: An International Journal*, 6(2): 75-86.
- Robson, C., (2011). *Real World Research (3rd ed.)*. UK: John Wiley & Sons Ltd.
- Rogers, M., and Ryan, R., (2001). The triple bottom line for sustainable community development. *Local Environment*, 6(3): 279-289.
- Rowley, J., (2002). Using case studies in research. *Management Research News*, 25(1): 16-27.
- SaMMA (n.d.). *Vi är SaMMA; Samverkansgruppen för minskatavfall*. Available at: <https://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKewi1pefDt7HMAhUFWywKHYP6Bs0QFggeMAA&url=https%3A%2F%2Fwww.naturvardsverket.se%2Fupload%2Fmiljoarbete-i-samhallet%2Fmiljoarbete-i-sverige%2Favfall%2Fmatsvinn%2FSaMMA-programforklaring-20150730.pdf&usg=AFQjCNEZ2wDQGH esn23NYizXz2ovk-91Q> [Accessed April 28, 2016].
- Schaltegger, S., Lüdeke-Freund, F., and Hansen, E.G., (2012). Business cases for sustainability: The role of business model innovation for corporate sustainability. *Int. J. Innovation and Sustainable Development*, 6(2): 95–119.
- Schneider, F., (2013a). The evolution of food donation with respect to waste prevention. *Waste Management*, 33: 755-763.
- Schneider, F., (2013b). Review of food waste prevention on an international level. *Waste and Resource Management*, 166(WR4): 187-203.
- SEPA (2012a). *Food Waste Volumes in Sweden*. Available at: [Food_Waste_quantities_in_Sweden_2012 ISBN 978-91-620-8695-4 \(pdf 863 kB\)](#) [Accessed March 31, 2016].
- SEPA (2012b). *From Waste Management to Resource Efficiency: Sweden’s Waste Plan 2012-2017*. Available at: <http://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjEm-eltLHOAhUBJJoKHTarAdYQFghGMAE&url=http%3A%2F%2Fwww.naturvardsverket.se%2FDocuments%2Fpublikationer6400%2F978-91-620-6560-7.pdf&usg=AFQjCNFFrxTZrPcNiRoKj01Yx8Oe2peTVw&sig2=JIOxijCIDc3u2hMdnjur RA> [Accessed April, 28, 2016].

- SEPA (2013). *Förslag till etappmål för minskad mängd matavfall*. Available at: <http://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/2013/etappmal2013forslag/matavfallsrapport-reviderad.pdf> [Accessed July 1, 2016].
- Shove, E., (2010). Beyond the ABC: Climate change policy and theories of social change. *Environment and Planning A*, 42(6): 1273-1285.
- Shove, E., Pantzar, M., and Watson, M., (2012). *The Dynamics of Social Practice –Everyday Life and How it Changes*. London, UK: Sage Publications Inc.
- Silvennoinen, K., Heikkilä L., Katajajuuri, J.M., and Reinikainen, A., (2015). Food waste volume and origin: Case studies in the Finnish food service sector. *Waste Management*, 46: 140-145.
- Singer, D.D., (1979). Food losses in the UK. *Proceedings of the Nutrition Society*, 38: 181-186.
- Spotswood, F., Chatterton, T., and Tapp, A., (2015). Analysing cycling as a social practice: An empirical grounding for behaviour change. *Transportation Research*, 29:22–33.
- Spradley, J. P., (1980). *Participant Observation*. New York, USA: Holt, Rinehart and Winston.
- Spurling, N., McMeekin, A., Shove, E., Southerton, D. and Welch, D., (2013). *Interventions In Practice : Re-framing Policy Approaches to Consumer Behaviour* (Sustainable Practices Research Group Report). Available at <http://www.sprg.ac.uk/projects-fellowships/theoretical-development-and-integration/interventions-in-practice---sprg-report> [Accessed July 4, 2016].
- Stake, R. E., (2008). Qualitative case studies 119-149, (Editors) Denzin, N. K., and Lincoln, Y. S., *Strategies of Qualitative Inquiry*. London, UK: Sage Publications Inc.
- Uppsala Vatten och Avfall AB (2014). *Avfallsplan för Uppsala kommun 2014-2022*. Available at: <https://www.uppsala.se/contentassets/d50514042453427aaa0f3e3a147702a5/avfallsplan.pdf> [Accessed June 7, 2016].
- Warde, A., (2005). Consumption and theories of practice. *Journal of Consumer Culture*, 5(2): 131-153.
- Watson, M., (2012). How theories of practice can inform transition to a decarbonised transport system. *Journal of Transport Geography*, 24: 488-496.

WRAP (2011a). *The Composition of Waste Disposed of By the UK Hospitality Industry*. Available at:

http://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjbrdXGtbHOAhWKNJoKHam3C2YQFggcMAA&url=http%3A%2F%2Fwww.wrap.org.uk%2Fsites%2Ffiles%2Fwrap%2FThe_Compotion_of_Waste_Disposed_of_by_the_UK_Hospitality_Industry_FINAL_JULY_2011_GP_EDIT.54efe0c9.11675.pdf&usg=AFQjCNEDI3TmwybWbefYBwhU7z3Vqo_H4w&sig2=RygY0K2TOTeoeMXjsR4xFw&bvm=bv.129391328.d.bGs [Accessed January 29, 2016].

WRAP (2011b). *Literature Review – Relationship Between Household Food Waste Collection and Food Waste Prevention*. Available at:

http://www.wrap.org.uk/sites/files/wrap/Impact_of_collection_on_prevention_FINAL_v2_17_8_11.33a4f2d0.11159.pdf. [Accessed August 3, 2016].

WRAP (2013). *Overview of Waste in the UK Hospitality and Food Service Sector*. Available at:

<http://www.wrap.org.uk/sites/files/wrap/Overview%20of%20Waste%20in%20the%20UK%20Hospitality%20and%20Food%20Service%20Sector%20FINAL.pdf> [Accessed April, 8, 2016].

Yin, R. K., (2009). *Case Study Research: Design and Methods (4th ed.)*. London, UK: Sage Publications Inc.

Internet (www)

American Biogas Council, <https://www.americanbiogascouncil.org>, n.d.

1. What is Anaerobic Digestion? [Accessed July 1, 2016]
https://www.americanbiogascouncil.org/biogas_what.asp

European Commission, <http://ec.europa.eu>, 2016

1. Eurostat: Severely materially deprived people [Accessed May 12, 2016]
http://ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=t2020_53&language=en
2. EU actions against food waste [Accessed April 28, 2016]
http://ec.europa.eu/food/safety/food_waste/eu_actions/index_en.htm
3. Directive 2008/98/EC on waste (Waste Framework Directive) [Accessed January 29, 2016]
<http://ec.europa.eu/environment/waste/framework/>
4. Biodegradable Waste [Accessed January 29, 2016]
<http://ec.europa.eu/environment/waste/compost/index.htm>

EWWR, www.ewwr.eu, 2016

1. The Project [Accessed August 8, 2016]
<http://www.ewwr.eu/en/project/main-features>

FAO (Food and Agriculture Organization of the United Nations), www.fao.org, 2016

1. Key facts on food loss and waste you should know! [Accessed January 26, 2016]
<http://www.fao.org/save-food/resources/keyfindings/en/>

Fusions, <http://www.eu-fusions.org>, 2016

1. About FUSIONS [Accessed July 7, 2016]
<http://www.eu-fusions.org/index.php/about-fusions>
2. Food waste policy framework, [Accessed April, 28, 2016]
<http://www.eu-fusions.org/index.php/about-food-waste/10-food-waste-wiki/283-food-waste-policy-framework>

Max, <http://max.se/sv/>, n.d.

1. Max Hamburgerrestauranger AB [Accessed June 29, 2016]
<http://max.se/sv/Om-Max/Foretaget/>
2. Hitta Max [Accessed June 29, 2016]
<http://max.se/sv/Hitta-Max/Restauranger/>
3. Vårt ansvar [Accessed June 29, 2016]
<http://max.se/sv/Ansvar/vartansvar/>
4. Klimat och miljö [Accessed June 30, 2016]
<http://max.se/sv/Ansvar/Klimatochmiljo/>

Naturvårdsverket, <https://www.naturvardsverket.se>, n.d.

1. Matavfallet behöver minska, 2016 [Accessed June 8, 2016]
<https://www.naturvardsverket.se/Sa-mar-miljon/Mark/Avfall/Matavfall/#>
2. Matsvinn [Accessed June 14, 2016]
<http://www.naturvardsverket.se/Miljoarbete-i-samhallet/Miljoarbete-i-Sverige/Uppdelat-efter-omrade/Avfall/Avfallsforebyggande-program/Matsvinn/>
3. Ökad återvinning av matavfall [Accessed June 14, 2016]
<http://www.naturvardsverket.se/Miljoarbete-i-samhallet/Miljoarbete-i-Sverige/Uppdelat-efter-omrade/Avfall/Atervinning-av-matavfall/>
4. Nationell avfallsplan, 2016 [Accessed August 8, 2016]
<http://www.naturvardsverket.se/Miljoarbete-i-samhallet/Miljoarbete-i-Sverige/Uppdelat-efter-omrade/Avfall/Avfallsplanen/>

Norden, <http://www.norden.org>, n.d.

1. Reducing food waste [Accessed March 29, 2016]
<http://www.norden.org/en/theme/green-growth/the-prime-ministers-green-growth-projects/developing-techniques-and-methods-for-processing-waste/reducing-food-waste>

SCB, <http://www.scb.se/>, 2016

1. Basfakta företag enligt Företagens ekonomi efter näringsgren SNI 2007. År 2000 – 2014, [Accessed June 29, 2016]
http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START_NV_NV0109_NV0109L/BasfaktaFEngs07/?rxid=208e9bee-a19d-4f1d-8b22-b55551675e36
2. Hierarkisk visning från avdelningsnivå och nedåt - SNI 2007, [Accessed June 29, 2016]
<http://www.sni2007.scb.se/snihierarki2007.asp?sniniva=3&snikod=561 &test=20>

Sverige Radio, <http://sverigesradio.se>, 2016

1. Alla kommuner borde samla in matavfall, [Accessed July 5, 2016]
<http://sverigesradio.se/sida/artikel.aspx?programid=83&artikel=6432517>

United Nations, <https://sustainabledevelopment.un.org/>, 2016

1. Sustainable Development Goals, [Accessed June 27, 2016]
<https://sustainabledevelopment.un.org/?menu=1300>

Uppsala Vatten, <http://www.uppsalavatten.se>, 2015

1. Abonnemang för hämtning av livsmedelsavfall, [Accessed July 8, 2016]
<http://www.uppsalavatten.se/sv/foretag/avfall-och-atervinning/abonnemang/livsmedelsavfall/>

Zocalo, <http://zocalo.se/>, n.d.

1. Zocalo, [Accessed, June 29, 2016]
<http://zocalo.se/>
2. Miljö, [Accessed, June 29, 2016]
<http://zocalo.se/om-zocalo/miljo/>

Personal Communication (Pers. Com.)

Cecilia, restaurant manager

Max, Uppsala, Sweden
June 17, 2016 interview

Poppy, part-owner and manager

Crêperie Lemoni, Uppsala, Sweden
July 4, 2016

Shamal, owner & head chef

Basilico, Uppsala, Sweden
June 7, 2016 interview

Simeon, manager

Zocalo, Uppsala, Sweden
June 16, 2016 interview

Participatory Observation (Part. Obs.)

Basilico

Uppsala Sweden
June 8, 2016

Max

Uppsala, Sweden
June 17, 2016

Zocalo

Uppsala, Sweden
June 20, 2016

Appendix 1: Types of food waste

Avoidable – food that is meant for human consumption and could have been eaten but instead is disposed of

Unavoidable – food waste that occurs during the preparation of food and is regarded as inedible

Possibly avoidable – food that is considered edible in one culture, but not edible in another

Table 5: Examples of different types of food waste (Bernstad Saraiva Schott & Andersson, 2015).

Types of food waste		
Avoidable	Unavoidable	Possibly avoidable
Unopened packaging Meat Other unopened food Opened packaging Meat Bread Dairy products Vegetables and fruit Other opened food Half eaten food Vegetables and fruit Dairy products Prepared food Non packaged whole vegetable/fruits	Tea and coffee grounds Peels, shells, cores and trimmings Bones, skin, fat Other unavoidable	Bread crusts Potato peels

Appendix 2: EU level food waste initiatives

Table 6: EU level food waste initiatives.

Initiative	Description
<i>The Roadmap to a Resource Efficient Europe</i>	An EU action affecting restaurant food waste in Sweden. Created in 2011, it seriously considers food waste, amongst other waste streams, and one of the goals of this initiative is to reduce avoidable food waste to zero by 2050 (European Commission, 2011). This initiative has milestones, of which one is to halve avoidable food waste in the EU by 2020 (European Commission, 2011, 18). The RREE uses the WFD hierarchy in figure 2 to help prioritize the management of waste. WFD goals and member state plans are expected to contribute and support the RREE goals as well (SEPA, 2012b).
<i>Sustainable Development Goals</i>	Adopted in 2015, the EU and member states are committed to meet the SDG goals. One of the goals includes a target to halve per capita food waste at retail and consumer levels by 2030 and to reduce food waste along the food supply chain (www, European Commission, 2, 2016; www, United Nations, 1, 2016)
<i>The Circular Economy Package</i>	An EU level attempt to create a more circular economy, by developing an EU methodology to measure food waste, support the SDG targets on food waste, share information, clarify EU legislation relating to food and food waste and aim to improve ‘best before’ date labeling (European Commission, 2015)
<i>Fusions</i>	Funded by the European Commission Framework Programme 7 this is a four year EU project that runs from August 2012 to July 2016 which works towards a more resource efficient Europe by reducing food waste. It works to support the delivery of the RREE, the EU target of 50 percent reduction of food waste, and a 20 percent reduction in the food chain’s resources inputs by 2020 (www, Fusions, 1, 2016).
<i>2014 European Year Against Food Waste</i>	An European Parliament effort to create awareness and a call for action to halve avoidable food waste by 2025 and presented 2014 as the European Year Against Food Waste (www, Fusions, 2, 2016)

Appendix 3: Interview guide for semi-structured interviews

Introduction

Would it be alright if we record the interview? (TURN ON RECORDER)

First of all we'd like to thank you for taking the time to be interviewed. Our thesis is about food waste in restaurants. More specifically we are investigating how restaurants treat food waste. The reason why we decided to write about food waste in restaurants is simply because nothing has been written on the subject yet. There has been a lot written on food waste in private households, which is also the main source for food waste in Sweden and come in second. We want to know how restaurants work with food waste, and we are doing this by conducting interviews with several restaurants. I would like to mention before we start that we are not here to judge your work but simply get a picture of what the reality in the restaurants looks like. We will document this interview, and send you a summary of the dialogue that you can then confirm.

- Do you have any questions before starting?
- What is your role within the company? (If we do not know this yet)
- How long have you been working here?
- What is your work background?
- How many employees does XXX have?
- How many customers or plates do you serve a day?

Food waste practices/routines

1. Do you consider food waste a problem?
2. What practices/policies/procedures does your company have regarding food waste, starting from when you order the food into the restaurant?
3. How do you dispose of food waste? Could you run us through the cycle? Who picks up your food waste? Do you pay by volume? Bin?
4. How much food waste do you generate? Have you records of this? Do you know how much your customers throw?
5. Do you have any reasons or incentives to sort your waste?
6. Do you have any reasons or incentives to minimize food waste?
7. Where does food waste come from in your restaurant (what are the sources of food waste?) Have you done anything to address that?
8. Do you have special programs set up in any capacity to manage food waste?
9. Have you changed your food waste practices in any way in the last decade? Why have you changed them?
10. Have you changed your food storage practices in the past decade? If you have, why? If you haven't, do you have plans to, or would you like to? Does your storage (cold and dry) work for this restaurant?
11. Does legislation or regulation have any impact on food waste in your restaurant?
12. Does health and safety and hygiene legislation have any effect on the amount of food waste?

13. Have you come across any information on the topic of food waste? For example newspapers, internet, pamphlets etc. If yes, has it inspired you to take any actions regarding food waste in your restaurant?
14. Who affects your work with food waste? Who motivates you?
15. Do your employees receive any training regarding food waste? (Are they educated on food waste and the problems that could arise from food waste?)
16. Are employees involved in food waste management? How?
17. Do you donate uneaten food to any other organizations?
18. What do you feel are barriers or challenges with preventing or minimizing food waste? (At a practical level in the kitchen, or at a legislative level)
19. Is it easy/difficult to manage food waste?
20. What do you think are the benefits from food waste reduction or prevention? (If they have sustainability practices or food waste prevention/minimization programs/goals ask: Do you communicate this with your customers/employees?)

General Sustainability Management

21. How is sustainability incorporated in the company?
22. Is it important for your company to operate sustainably? Why? How?
23. Do you plan to develop your sustainability plans in the future? What are your goals?

Conclusion

Can we get back to you with any additional questions?

Thank you very much for your time!

Appendix 4: Participatory observation guide

Table 7: Participatory observation guide (Spradley, 1980 in Robson, 2011).

Element	Description of element to be observed	Notes
Space	Layout of the physical setting; rooms, outdoor spaces, etc.	
Actors	The names and relevant details of the people involved.	
Activities	The various activities of the actors.	
Objects	Physical elements, furniture etc.	
Acts	Specific individual actions.	
Events	Particular occasions, e.g. meetings.	
Time	The sequence of events.	
Goals	What actors are attempting to accomplish.	
Feelings	Emotions in particular contexts.	

Appendix 5: Restaurant food waste literature

Table 8: Restaurant food waste literature (Inspired by Schneider, 2013b, 196-197; Garrone et al., 2014, 135).

Source	Agriculture / Fishing	Food producers Processing/manufacturing	Wholesale/ Trade/ Retail	Hospitality/ Food service	Consumer/ Household consumption
Singer (1979)	This report discusses the terminology in food waste/loss, the units of measuring food waste, and summarizes results from previous UK studies. One much discussed study was on two restaurants and at what stage food waste is generated.				
Engström & Carlsson-Kanyama (2004)				A Swedish study of two schools and two restaurants aimed at looking at causes of food waste and the impacts of food waste on the environment.	
European Commission Report (2010)* Monier <i>et al.</i>	This report looks at the causes of food waste across the entire food supply chain and establishes a baseline of food waste data for the EU. It also looks at the environmental impacts of food waste and presents the food waste prevention methods and attempts to develop policy recommendations for prevention.				
FAO (2011)* Gustavsson <i>et al.</i>	This report includes two studies on global food losses and waste. The first study looks at losses and waste in medium/high income countries and the other focuses on low income countries. It was carried out for the SAVE FOOD! Congress, an initiative to raise awareness about the impact of food losses on poverty, hunger, climate change and natural resources.				
WRAP (2011a)*				A UK research study estimates the amounts, types, and causes of waste, including food waste, within the hospitality, for-profit sector, which includes restaurants.	
Nordic Council of Ministers (2012)*				The study, covering the hospitality for-profit sector in Denmark, Finland, Norway, and Sweden, provides information on the causes and preventative measures of avoidable food waste.	
Beretta, Stoessel, Baier, & Hellweg (2013)	This study suggest that the reduction of food losses across the entire food supply chain in Switzerland is needed to make the food system efficient. It looked at 22 food categories from 31 companies and analyzes the mass and energy flows and found that avoidable food losses could lessened if given mitigation measures. It also found that most avoidable food loss occurs at the agricultural production, processing, and household levels.				
Kallbekken and Sælen (2013)				The hotel restaurant experiment found that using smaller plate sizes at buffets reduces food waste and provided financial savings to the hotel.	
Schneider (2013a)	This study provides a historical account of food donation and food banks in the USA, Europe, and Columbia. It discusses the societal, environmental, and economic impacts of food donations from a sustainability perspective as well as barriers to implementing food donation programs				

WRAP (2013)*				Similar to the WRAP study in 2011, this report looks at food waste in the UK hospitality and food service sector. It discusses sources of food waste as well as suggests monitoring and management practices.	
Garrone, Melacini, Perego (2014)	Covering the food supply chain, this study, through exploratory case studies, identified the sources of food waste and proposed preventative measures.				
Halloran, Clement, Kornum, Bucatariu, & Magid (2014)	The article looks at the food waste causes and preventative measures across the food supply chain in Denmark. It includes commercial kitchens which consists of restaurants and canteens.				
Katajajuuri, Silvennoinen, Hartikainen, Heikkilä, & Reinikainen (2014)				This study mapped the avoidable food waste in Finnish food service outlets and households.	
Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer (2015)	A literature review on consumer behaviour and food waste across the food supply chain. Most of the results focus on the household and retail level, but the review discusses consumer behaviour in restaurants as well.				
Fusions (2015)*	This report reviews and analyzes the current legislation and policies impacting food waste at the EU and individual Member state levels.				
Silvennoinen, Heikkilä, Katajajuuri, & Reinikainen (2015)				A Finnish study on 51 food service outlets studied the volume and composition of food waste in the food service sector.	
Leal Filho & Kovaleva (2015)*	This book discusses food losses and waste in Belarus, Estonia, Germany, Latvia, Lithuania, Poland, and Sweden across the entire food chain. It provides causes of food waste, methods of food waste reduction, the state of the food waste problem in the countries, and offers recommendations.				

*Report did not undergo academic, peer-review process

Appendix 6: Food waste practices

Table 9: Food waste practices in case study restaurants.

Practice	Observed or discussed in:			
	Basilico	Crêperie Lemoni	Max	Zocalo
Doggy bags	X	X		X
Delivery	X	X	X	X
Storage	X		X	X
Sorting	X	X	X	X
Donating	X	X	X	X
Food usage optimization	X	X	X	X
Portion size	X			
Food safety and hygiene	X	X	X	X
Recycling of oil		X	X	
Separate customer food waste			X	X
Recording of goals			X	
Company food quality standards	X	X	X	X
Training	X	X	X	X
Planning/demand forecasting	X	X	X	X
Communication	X	X	X	X