

13 Multi-level governance of food waste

Comparing Norway, Denmark and Sweden

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13.1 Introduction

While numerous political initiatives and civil society efforts have, for years, focused on undernourishment and hunger in vulnerable regions, an astonishing one third of all edible food produced globally is wasted (FAO, 2011). Studies commissioned by the United Nations Food and Agriculture Organization (FAO) estimate annual global food loss and waste by quantity for root crops, fruits and vegetables (40–50%), fish (35%), cereals (30%), oilseeds, and meat and dairy products (20%) (FAO, 2015, p. 2). Without a doubt, the alarming scale of food waste indicates a substantial market failure. Global food waste translated directly to economic terms has a value of US\$1 trillion annually (FAO, 2015, p. 3). Another FAO study of total global costs of food waste estimated that apart from the direct economic loss, indirect environmental costs can be translated to some US\$700 billion, and social costs of around US\$900 billion per year (FAO, 2014). What is more, food waste is also a huge environmental challenge. Uneaten food is not only a loss within its own production chain, but squanders other valuable resources (land, water, energy and labour). It has a direct impact on the global climate – estimates suggest that global food loss and waste generate 4.4 Gt CO₂eq annually, which is some 8% of total anthropogenic GHG emissions (FAO, 2015, p. 3). The European Commission's analyses conclude that the food sector, together with housing and transport, has the largest environmental impacts in Europe, and that food waste has negative impacts due to the production burdens of uneaten food and waste treatment (Stenmarck, Hanssen, Silvennoinen, Katajajuuri & Werge, 2011). Lastly, but no less importantly, the scale of food waste is a significant moral issue. All the starving and malnourished people around the world could be fed using only a portion of the food we see being wasted.

Given the alarming scale of food waste, with edible food landing in composts, landfills and incineration plants, it is somewhat surprising that the problem stayed below the radar of most politicians, scientists and civil society activists for a long time. Scholars note that 'until recently, food waste has

been largely ignored' (Halloran, Clement, Kornum, Bucatariu & Magid, 2014, p. 295), and that the issue started to appear on political agendas and in public debates only in the 2010s. Although reducing food waste seems a win-win situation for consumers, our planet and industries, it is a very complex issue, requiring diverse and well-tailored governance measures. It is known that the scale and occurrence of food waste in the value chain depend on the economic situation, climate, local culture and consumer habits. There are also significant tensions between the food security and resource efficiency perspectives (Hartikainen, Mogensen, Svanes & Franke, 2018, p. 509). In medium- and high-income countries, food waste is mainly caused by consumer behaviour and a lack of coordination between different actors in the supply chain. While the first relates to poor purchase planning, food labelling ('best-before dates') and customers' expectations regarding a wide range of fresh products and discounts for buying more, the latter is a systemic failure. This can be illustrated by farmer-buyer agreements that specify certain product characteristics related to appearance (FAO, 2011), retailer rights to return unsold products or a lack of knowledge on how to handle certain products (Stenmarck et al., 2011).

In the last decade, many international, national and local initiatives were created in order to address the food waste problem. The UN's Sustainable Development Goal 12, aiming to 'ensure sustainable consumption and production patterns', lists several targets related to food waste. It foresees that by 2030 we ought to be able to 'halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses' and 'substantially reduce waste generation through prevention, reduction, recycling and reuse', but also 'encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle' (SDG, 2015).

Many initiatives exist on the supra-national level, e.g. the multi-stakeholder Save Food Initiative (of FAO, UNEP, Messe Düsseldorf and Interpack packaging company), with their Think Eat Save campaign (Save-Food, 2018). Different solutions for tackling waste are being explored upstream and downstream of the production chain, in high- and low-income countries.

However, no single blueprint for tackling the problem exists, and this is especially visible on the national level, where a number of domestic political, economic and cultural factors influence the way food waste is tackled. This chapter provides a comparative analysis of the governance and the resulting policies and tools introduced by three high-income Nordic countries: Denmark, Sweden and Norway. In all three cases, the food waste issue has been relatively high on the political agenda for almost a decade, and the different governance frameworks that have emerged to reduce food waste provide interesting insights into food waste reduction strategies. Even though the three share many similarities in terms of political, cultural and economic

features, such as a consensual parliamentary political culture, traditionally strong labour unions and social democratic parties, as well as a distinct regional identity, they also vary in some respects, and as our research finds, governance of food waste is one of them. The chapter describes these national governance arrangements and explains this observed variation. We first briefly discuss the theoretical and methodological foundation for our research, and then present food waste governance from a historical perspective, with a particular focus on the actors and milestones involved. We then move to a comparative analysis of the three countries, from which we draw conclusions and offer possible policy recommendations. We further categorise the observed governance systems and highlight important actors, who, in each of these cases, have proven particularly dedicated to food waste reduction.

13.2 Theoretical approach and method

We apply a multi-level governance framework to organise our comparative analysis of the three country case studies. Multi-level governance is a concept initially proposed to capture the changing nature of policymaking and policy implementation in the European Union (Hooghe & Marks, 1996). The approach builds on the growing complexity of tailoring accurate policy measures in modern states, especially in light of ‘subsidiarity’ and the emergence of sub-national authority levels as part of the European Union. Marks was one of the first to introduce the phenomenon in the 1990s (Stephenson, 2013, p. 818), and the concept has picked up a great deal of academic currency since, mostly because it has been shown to best reflect the nature of modern European politics.

The diffusion of authorities and competences, the creation of transnational regimes and the proliferation of public–private partnerships are all trends observed in the last three decades, challenging traditional forms of hierarchical authority and undermining traditional centralised forms of government (Hooghe & Marks, 2010, p. 17). ‘Multi-level’ refers to different levels of ‘governance’, i.e. ‘above’ national (European), national and sub-national, but it also implies the involvement of both public and private actors at these levels (Van Kersbergen & Van Waarden, 2004, pp. 149–150). Multi-level

Table 13.1 Two types of multi-level governance arrangements

<i>Type I</i>	<i>Type II</i>
General purpose	Task specific
Well ordered	Fluid, intersecting memberships
Clear lines of accountability	Accountabilities less clear
‘Russian doll set’	Puzzle of many units, providing services, solving problems

Sources: Bache, 2012; Marks & Hooghe, 2004; Smith, 2007; Stephenson, 2013.

governance studies investigate the move from centralised forms of authority to more fluid, problem-focused networks (Smith, 2007) and are well suited to comparative analyses (Stephenson, 2013, p. 830). Marks and Hooghe operationalise this term by distinguishing between two ideal types of multi-level governance: type I and type II (Marks & Hooghe, 2004).

Scholars applying multi-level governance need to be careful and reflective in the way they employ the approach. As already noted, it is both a descriptive metaphor and an analytical framework for studying change in public policy making. At the same time, multi-level governance is simultaneously a framework for analysis, a *solution* for collaboration between stakeholders and a strategy for better policy implementation, improved information and consultation, and should improve the quality of decision-making and implementation (Gollata & Newig, 2017). Empirical evidence indicates that polycentric governance systems produce greater environmental outputs than monocentric ones (Newig & Fritsch, 2009). In the context of food waste, multi-stakeholder collaboration and public-private partnerships are necessary to find sustainable solutions to reducing food waste (Halloran et al., 2014).

In this analysis, we try to provide an overview of existing food waste policies and governance arrangements, and so we employ multi-level governance as an analytical framework, operationalising the two ideal-typical arrangements – type I and type II – in a comparative analysis. In the conclusion, drawing lessons and policy recommendations from our research, we reflect on food waste multi-level governance as a strategy or benchmark for good governance and effective policy for tackling the problem.

Multi-level governance gives us an effective tool with which to conduct a structured comparison of the three cases. We identify the relevant actors, i.e. all stakeholders and institutional actors who influence the food issue area, and we look at their sectoral category (public, industry and third sector), as well as the levels of governance on which they operate. Further, we analyse the different policy outcomes, and categorise them according to the ideal-typical distinction proposed by Hooghe and Marks, identifying characteristic elements of type I and type II arrangements (Table 13.1).

The empirical part of the chapter builds on a wide-ranging review of secondary scientific literature, government documents, public and industry statistics and applied grey literature. This is combined with the data gathered at an expert workshop on food waste, hosted by the Nordic Institute for Studies in Innovation, Research and Education (NIFU) in Oslo on 23 November 2017, and supported by ten expert interviews conducted by two of the authors in the spring of 2018 with food waste researchers, NGOs and industry and policy representatives.

13.3 Background

13.3.1 Definitions

The first challenge in any food waste-related research and action is defining the problem, since no internationally agreed definition of food waste exists (Hartikainen et al., 2018). Food waste can be *edible* and *non-edible*, *avoidable*, *possibly avoidable* and *unavoidable*. It can appear at different stages of the value chain (primary production, handling and storage, in processing and packaging, distribution or at the consumption stage). It can be distinguished from food loss in primary production, e.g. during harvesting. It is also debatable whether goods produced for human consumption but used for animal feed or biogas production should also be considered food waste.

Another important factor is the cultural definition of *edibility* as only parts defined as edible can become food waste or food loss (Klitkou & Iversen, 2016). This culturally constructed category (e.g. some parts of animals are considered inedible and discarded in certain societies while they are eaten elsewhere) may also change over time, influencing the measured scale of food lost or wasted. Edibility is also an important category at the end of the chain, as certain volumes of food will be deemed inedible for health and safety reasons (e.g. due dates). Departing from this food input–food output perspective, a systemic approach to food chains allows us to introduce more nuanced categories relating to food quality loss or possible degradation of products (Klitkou & Iversen, 2016, pp. 9–10).

Food waste data may be collected in tons, calories, economic values, etc. In Denmark and Sweden industrial food waste data is more confidential than in Norway¹ and some European Union (EU) data is not available for Norway. For instance, Eurobarometer surveys for food waste are not conducted in European Economic Area (EEA) states. All these questions translate to direct difficulties for research, including methodological challenges when comparing the three Scandinavian countries. In response to this problem, the Nordic Council of Ministers initiated a process aiming to develop common definitions of food waste for all Nordic countries (Swedish EPA, 2013).

To illustrate the different definition types and their implications, we can refer to the Norwegian industry agreement on reduction of food waste, signed on 23 June 2017, which stated that

food waste includes all edible parts of food produced for humans, but which is either disposed of or removed from the food chain for purposes other than human consumption, from the time when animals and plants are slaughtered or harvested.

(Regjeringen, 2017)

This is considered a ‘strict’ definition of food waste because it also categorises food produced for humans but used for animal feed or biogas as food waste.

In comparison, FUSIONS (Food Use for Social Innovation by Optimizing Waste Prevention Strategies), a European project in which Norway is an active participant, used a different and notably less ‘strict’ definition, understanding food waste as ‘any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed (including composted, crops ploughed in/not harvested, anaerobic digestion, bio-energy production, co-generation, incineration, disposal to sewer, landfill or discarded in the ocean)’ (FUSIONS, 2014).²

13.3.2 Food waste hierarchy

The waste pyramid is a framework created to define, prevent and manage waste (see also Chapter 3) which has since been adopted for surplus food and food waste concerns. Taking a combined sustainability perspective, it lists strategies for dealing with food waste from ‘best’ to ‘worst’ (Bugge, Dybdahl & Szulecka, 2018). According to the hierarchy, the best possible option is always to prevent food waste through minimising food surpluses and avoidable waste. The second best option is to re-use the food that would otherwise be wasted through redistribution, food banks and all possible forms of charity and redistributing organisations. This is followed by food waste recycling, as animal feed and through composting. The fourth option is energy recovery, while the least favourable option is waste disposal (Papargyropoulou, Lozano, Steinberger, Wright & Ujang, 2014). The pyramid is also useful when considering the definition problem. The Norwegian definition puts food waste as anything below re-use, while the FUSIONS definition sets the boundary closer to the recycling stage (see Figure 13.1).

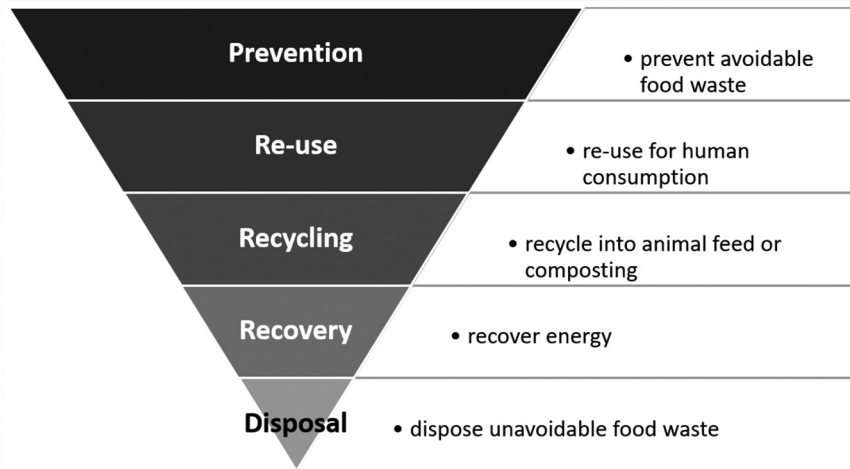


Figure 13.1 The food waste hierarchy.

13.3.3 Comparative food waste assessments in Scandinavia

The scale of food waste in the three analysed countries can be divided according to position on the value chain. Food waste quantification in *primary production* shows that Denmark is in the lead (288,000 tons), followed by Sweden (277,000 tons) and Norway (85,000 tons) (Hartikainen et al., 2018, p. 508). This might be explained by the fact that utilised agricultural areas cover only 3.1% of Norway's land territory, equalling one million hectares (EUROSTAT, 2012b), while they cover 7% of land and three million hectares in Sweden (EUROSTAT, 2012c), and as much as 61% and 2.5 million hectares in Denmark (EUROSTAT, 2012a). Taking into account these agricultural areas, relative food waste from primary production is quite comparable, yet Denmark is still in the lead.

Data from the *retail* sector shows that Sweden had double the amount of absolute food waste at this stage (83,500 tons per year in the retail sector) but considering the fact that Sweden has twice the population of Norway (43,000 tons) and Denmark (40,000–46,000 tons), the data seems very comparable (Stenmarck et al., 2011).

Some *combined value-chain* data on food waste from households, retailers and wholesalers, presented in kilograms of food waste per capita, shows that Denmark has the highest volume of food waste per citizen (above the EU average) and a very large share of food waste in groceries, while Norway and Sweden are more comparable, and are slightly under the EU food waste average (Figure 13.2) (Stensgård & Hanssen, 2018). However, the data is from different years, and the Norwegian data is most up-to-date, especially compared to EU data, making a direct comparison difficult. This will be further discussed in the comparative analysis. In section 13.4, we present the

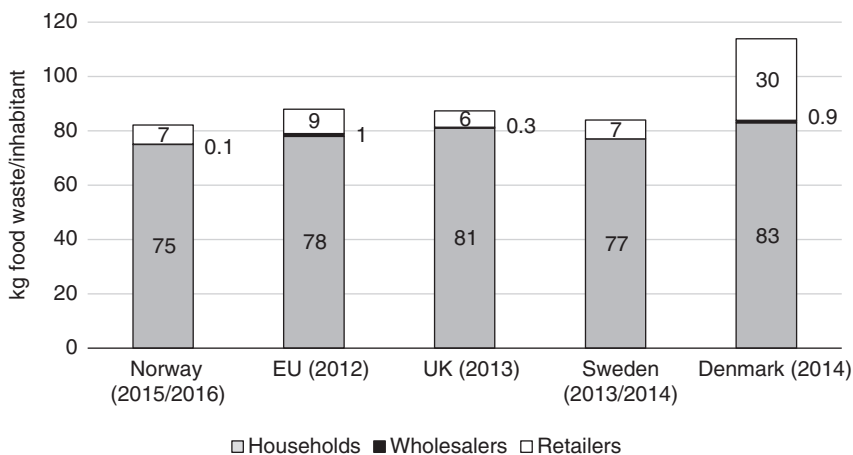


Figure 13.2 Combined value chain data on food waste in kg per inhabitant, including inedible parts, excluding primary production and waste that is used for animal feed (adapted from Stensgård & Hanssen, 2018).

most recent numbers for each country. Because of the differences in years and changing food waste definitions and units of measurement, the numbers can differ slightly from the comparative synthesis in 13.3.3.

13.4 Analysis

13.4.1 Food waste governance in Norway

Food waste has recently been identified as a very significant and pressing problem in Norway. The ForMat project (2010–2015), a collaborative endeavour involving the food industry, research organisations and state agencies to prevent food waste, estimated that food was wasted at all four stages of the value chain (industry, wholesale, retail and households) and amounted to 355,000 tons in 2015, worth about NOK 20 billion (Stensgård & Hanssen, 2016). Food wasted annually in Norway could potentially feed 900,000 people, and creates emissions equal to those of 375,000 cars (Lindahl, 2016), totalling 978,000 tons of CO₂ (Boffey, 2017). The distribution of food waste in the value chain is very uneven, with 61% generated by households, 21% by producers, 1% by wholesalers and 17% by retailers (Stensgård & Hanssen, 2016).

The ForMat project reshaped the food waste debate in Norway with extensive surveys of food waste in the food chain. Matvett, a non-profit multi-stakeholder hub and the administrator of ForMat, worked with the business sector, five ministries and Østfold Research (Østfoldforskning) to put food waste on the agenda in Norway. This was a very important first step as no statistics on food waste existed in Norway prior to ForMat. Although the target of 25% reduction in food waste by the end of the project was not reached (food waste levels in the project period fell by 12% (Stensgård & Hanssen, 2016)), the ForMat project drew international interest, due to its openness, methodologies and strong public–private collaboration. The data collection was unique in the entire European context, with documented measuring methods, and details on food waste quantities in the different stages of the value chain.

The work of the ForMat network led the industry to prepare an *Agreement of Intent to reduce food waste*, signed on 7 May 2015 (Regjeringen, 2015). The Agreement was further developed and finalised on 23 June 2017 in the form of an *Industry Agreement on the reduction of food waste* between five ministries and a dozen industry organisations. The agreement had a main reduction target of 50% by 2030, which was further subdivided into two sub-targets: 15% by 2020 and 30% by 2025 (Regjeringen, 2017). In parallel, the narrower Cut Food Waste 2020 (*KuttMatsvinn2020*) is another initiative and result of the ForMat collaboration, targeting the hospitality sector. It aims to cut food waste by 20% by 2020 (NorgesGruppen, 2016).

Alongside the Industry Agreement, a parallel law-making and governance design process with the aim of reducing food waste took place in the Norwegian Parliament. In 2016, a parliamentary committee asked the government

to evaluate the introduction of a potential food waste law (similar laws had recently been introduced in France (Mourad, 2015) and Italy), meant to strengthen the bottom-up voluntary process with binding state regulation. The final evaluation issued in September 2017 by the Ministry of Agriculture and Food concluded that the Industry Agreement was a sufficient first step in emerging Norwegian food waste governance, putting the binding public regulation on hold. Because of the strong food waste reduction commitment of the opposition, a food waste law is still on the political agenda. The Parliament backed by the Labour Party (Ap), the agrarian Centre Party (Sp), the Socialist Left (SV), the Christian Democrats (KrF) and the Greens (MDG) asked the government to draft a proposal for a food waste law with emphasis on the food industry (NTB, 2018). The draft was expected at the end of 2018.

One Norwegian NGO was particularly active in food waste reduction campaigns and support for the state regulations: Future in our Hands (*Framtiden i våre hender*) wrote many press articles regarding food waste and delivered a petition to the Norwegian Parliament. It also recently started to work with municipalities and consumers through its 'MatVinn' project (Riise Jenssen, 2017).

A number of bottom-up initiatives appeared, e.g. a mobile app TooGoodToGo brought to Norway from Denmark. Online shopping websites and traditional shops started selling food that would be discarded in traditional supermarkets due to nearing best-before dates (e.g. the Best Før supermarket, as well as Holdbart stores and online shopping, etc.). Another interesting initiative is a student restaurant concept offering gourmet lunches made from food that is approaching its expiration date. Since its start on the Blindern campus at the University of Oslo in 2015, it has further expanded to the Oslo Metropolitan University (in 2017).

Summing up, it can be said that in Norway the main driver of food waste governance is the industry, collaborating with civil society actors and public administration.

Box 13.1 Milestones in food waste governance in Norway

- **2010:** Launching of ForMat, a business-driven project involving the collaboration of supermarkets, food industry organisations and public authorities (industry driven)
- **Spring 2012:** The NGO 'Future in our Hands' launched a series of food waste reduction articles, events and campaigns (civil society driven)
- **August 2013:** Norway launched a national waste management strategy 'From Waste to Resources' (public agency driven)
- **Autumn 2013:** First food bank in Oslo emerges, orchestrated by the Church Mission, the Blue Cross and the Salvation Army. The authorities, industry (NorgesGruppen) and the ForMat project all supported the idea (civil society driven)

- **Spring 2015:** First food waste restaurant (KUTT Gourmet) at the University of Oslo (civil society driven)
- **7 May 2015:** The ‘Agreement of Intent to reduce food waste’, signed by the food industry and authorities (industry driven)
- **4 January 2017:** ‘KuttMatsvinn2020’ cut food waste by 20% by 2020 (industry driven)
- **23 June 2017:** Finalisation of ‘Industry Agreement on reduction of food waste’ (industry driven)
- **22 September 2017:** The evaluation of the food waste law was negative because of the *Industry Agreement* (public agency driven)

13.4.2 Food waste governance in Sweden

Food waste in Sweden is defined as ‘avoidable food waste – food that is discarded but could have been eaten had it been handled properly’ (Naturvårdsverket, 2013, p. 29). Examples of avoidable food waste are bread, food leftovers, fruit and vegetables. Avoidable food waste was sometimes referred to as *food wastage*. In 2014, 1,278,000 tons (equivalent to 134 kg/person³) of food waste was generated in Sweden (see Table 13.1 in Elander, Sternmarck & Ostergren (2016)). The total volume of food waste was calculated along the food value chain from primary production, food producers, distributors, retailers and consumers.

In the last few years, Sweden has paid increasing attention to the food waste issue. The EU Directive (2008/98/EC) on waste (the Waste Framework Directive) required European Union member states to establish waste prevention programmes. As of June 2018, Sweden has not yet implemented a specific strategy or national plan for food waste management and reduction. Nevertheless, it embedded proposed milestone targets for food waste in several national plans such as the Swedish Waste Management Plan 2012–2017 and the Swedish Waste Prevention Programme 2014–2017 (Elander et al., 2016). The first had important provisions on energy and nutrient recovery from food waste as it assumed that by 2018, 50% of food waste from consumption would be collected separately and treated biologically (Naturvårdsverket, 2012). The other assumed a waste reduction by 2020, at least 20% compared to 2010, throughout the entire food value chain (except for primary production) (Naturvårdsverket, 2014). A separate action plan has been developed for food wastage reduction in primary production. The Swedish Environmental Protection Agency (EPA) was commissioned by Sweden’s government to create ‘interim objectives for decreasing avoidable food waste, and to suggest measures for reaching the target’ (Naturvårdsverket, 2013, p. 31).

Food waste reduction in Sweden was also targeted together with CO₂ emission reductions at the municipal level, for example through the Klimatsmart campaign, which aims to reduce food waste in school canteens (Klimatsmart, 2018).

An important milestone in Swedish food waste reduction governance was the creation of SaMMA (Swedish Collaboration Group for Reduced Food Waste) in 2012. The Swedish EPA initiated SaMMA as a liaison group for food waste prevention, information exchange and to assist in reducing food waste. It includes the National Food Agency (*Livsmedelsverket*) and the Stockholm Consumer Cooperative Society (*Konsumentföreningen Stockholm*). It is coordinated by the Swedish EPA, Swedish Board of Agriculture and Sweden's National Food Agency, all taking turns to host meetings, which are held several times a year. The network was designed to help reduce food waste in Sweden by promoting collaboration throughout the food supply chain. By collaborating with political representatives, researchers, authorities, organisations and businesses can discuss issues and share experiences and knowledge (Naturvårdsverket, 2013).

In 2013 a public campaign called 'Stop food waste' (*Stoppa matsvinnet*) was launched by Sweden's National Food Agency, the Swedish EPA and the Swedish Board of Agriculture to inform and inspire people about how to reduce food waste (StoppaMatsvinnet, 2018).

Governmental bodies such as Sweden's National Food Agency, the Swedish EPA and the Swedish Board of Agriculture played a key role in food waste governance in Sweden. These public agencies set up targets, launched programmes and initiated different campaigns and initiatives to fight food waste.

Box 13.2 Milestones in food waste governance in Sweden

- **2009:** The Campaign 'Climate Smart' was first launched by Halmstad municipality, aiming to decrease food waste in school canteens to reduce carbon footprint (public agency driven)
- **2012:** A target to collect 50% of food waste from consumption separately and treat it biologically by 2018 was included in the Swedish Waste Management Plan 2012–2017 of the Swedish Environmental Protection Agency (public agency driven)
- **2012:** SaMMA Swedish Collaboration Group for Reduced Food Waste was founded as a broad network involving research bodies, businesses and civil society (public agency driven)
- **2013:** The public campaign 'Stop food waste' (*Stoppa matsvinnet*) was launched (public agency driven)
- **2013:** A target was set for reducing food waste along the entire value chain by 20% in 2020 compared to 2010 in the Swedish Waste Prevention Programme 2014–2017 developed by the Swedish EPA, Swedish Board of Agriculture and the National Food Agency of Sweden (public agency driven)
- **2013–2015:** The campaign Stop Food Waste Now – an initiative to inform and inspire people to reduce food waste – was launched by the National Food Agency, the Swedish EPA and the Board of Agriculture (public agency driven)

13.4.3 Food waste governance in Denmark

According to the Danish Ministry of Environment, Danes throw away 700,000 tons of edible food annually (Gadd, 2017). Danish retailers create 45,676 tons of food waste per year (Halloran et al., 2014), while households are responsible for about half of the total amount (Kjær & Werge, 2010).

Actions aiming to reduce food waste in Denmark started largely as a consumer movement, led by the influential activist Selina Juul and the movement ‘Stop Wasting Food’ (*Stop Spild af Mad*), established in 2008 (Stop Spild Af Mad, 2018). It is considered the largest European non-profit consumer movement against food waste, and is strongly supported by Danish citizens, as well as Members of the European Parliament, Members of the Danish Parliament, top Danish chefs and food personalities (Halloran et al., 2014).

Danish food waste figures were higher than the EU average (Figure 13.2) but have fallen sharply in the last decade. The trade magazine *Dansk Handelsblad* reported that Denmark is the leading country in the EU regarding the number of initiatives to limit food waste (FUSIONS, 2015). NGOs, retailers, the hospitality sector, authorities, industry and consumers are all participating in various actions to cut food waste (FUSIONS, 2016). In response to this development, Denmark’s Prime Minister put the food waste problem on the political agenda. In 2011 the Ministry of the Environment established a public-private partnership called ‘Initiative Group Against Food Waste’ to exchange information and work together on food waste reduction. In the same year, a ‘Charter on Less Food Waste’ was signed by different ministries and industry representatives. This can be seen as an example of industry self-regulation through a voluntary agreement on food waste. In 2013 the Danish Consumer Council initiated a consumer awareness campaign on food waste (Halloran et al., 2014).

The civil movement’s success was based on its wide societal resonance, partnerships and cooperation with both the authorities and the private sector. It also expanded its links with academia, with Selina Juul initiating the first think tank in the world dedicated to food waste prevention. Many public and industry initiatives were developed together with NGOs (ThinkEatSave, 2015). In recent years, innovative applications have been developed in Denmark to fight food waste (including YourLocal, ReFood, Green Menu Planner, etc.). A Danish humanitarian NGO opened Wefood, the first food waste supermarket.

Between 2010 and 2015, Denmark’s food waste was reduced by 25% (translating to an economic saving of DKK 4.4 billion). This was considered a European record, followed only by the United Kingdom’s reduction of 21% between the years 2008 and 2013 (FUSIONS, 2016).

Box 13.3 Milestones in food waste governance in Denmark

- **2008:** Activist Selina Juul established the leading organisation ‘Stop Wasting Food’, the largest such movement in Europe, with the aim of raising awareness about food waste (civil society driven)
- **2008:** Major food store chain REMA 1000 stopped ‘buy 2 get 3’ sales and only sold by the piece to reduce consumer food waste (industry driven)
- **2011:** The Ministry of the Environment established a voluntary ‘Initiative Group Against Food Waste’ with stakeholders representing the public and private sectors (public agency driven)
- **2011:** The ‘Charter on Less Food Waste’ created and signed by nineteen major stakeholders such as various supermarket chains, restaurants, ministries and hotel chains (cross sectoral)
- **2011:** The Ministry of the Environment established the ‘Initiative Group Against Food Waste’ (public agency driven)
- **2013:** Ministry of Environment and Food introduced a strategy on growth and resource-efficiency on food and a fund to support food waste reduction actions (public agency driven)
- **2013:** The Zero Waste initiative was launched by municipalities with the aim of raising public awareness and making citizens the pivot of anti-waste initiatives (public and civil society driven)
- **2013:** The Danish Consumer Council initiated a campaign to increase awareness of food waste (civil society driven)
- **2014:** Launch of the Danish Government Resource Plan for Waste Management 2013–2018 (public agency driven)
- **2015:** YourLocal was the first mobile app to help small businesses and supermarkets fight food waste (civil society driven)
- **2016:** The ReFood initiative, in partnership with Stop Wasting Food, united 800 restaurants, cafes, food producers and institutions. Partners could use the ReFood label to show their commitment to reducing food waste (civil society driven)
- **2016:** The world’s first food waste think tank – ThinkEatSave – was established to gather knowledge and develop action plans to combat food waste (civil society driven)

13.4.4 Comparative analysis of governance pathways

The country-level analysis shows very different governance pathways that can be identified in the three countries with regard to food waste reduction. Although a variety of stakeholders take action to reduce food waste in each country, certain leaders can be highlighted. We identify them as drivers for food waste action, establishing powerful collaborations between different actors, levels and sectors in all three countries. We notice a ‘spill-over’ effect of sorts: where food waste reduction initiatives and the leading actors should be given credit for shaping the agenda, pushing for action and proposing innovative solutions, but not for taking unilateral action.

Governance differences may also be linked to citizens' expectations. The Eurobarometer report on food waste and date marking (unfortunately only available for Sweden and Denmark, not conducted in Norway) points to different actors that should take responsibility for preventing food waste. In Denmark and Sweden, consumers are indicated as being responsible (85% and 88% respectively), followed by shops and retailers (68% and 75%), the hospitality sector (59% and 66%), food manufacturers (51% and 58%), public authorities (44% and 58%) and farmers (27% and 28%) (EUROBAROMETER, 2015). This shows that the biggest difference is regarding the role of public authorities, where significantly more Swedes expect a state intervention compared to Danes. Interestingly, among the twenty-eight analysed countries in this report, the highest responsibility of shops and retailers is perceived in France (90%) and the highest responsibility of public authorities in Spain and France (77% and 74% respectively). Both these factors can explain France's lead in European food waste legal regulation (EUROBAROMETER, 2015).

13.4.5 Comparative analysis from a multi-level governance perspective

It is worth noting that food waste governance in Sweden is closer to the traditional centralised forms of steering, with the Swedish EPA taking a clear lead in tackling the food waste problem. It is therefore in line with the type I multi-level governance characteristics presented in Table 13.1. Open collaboration with industry and civic society partners also signals that the state is trying to coordinate all efforts to reduce food waste.

While in Sweden, initiatives were worked out 'mostly in the public sector',⁴ in the Norwegian case, initiatives to prevent food waste 'always came from the industry'. In many countries, food waste regulations started with e.g. food banks; in Norway 'it started with the industry'.⁵ Voluntary self-regulation occurred in the shadow of hierarchy (Héritier & Eckert, 2008; Newman & Bach, 2004) and the role of the traditional state authorities was limited in the early agenda setting and food waste policy formulation phase. It was, however, understood that if the industry tackled the problem 'before the politicians', it would 'bring cheaper and more effective solutions'.⁶ It is nevertheless clear that public agencies are paying close attention to the tangible effects of self-regulation and a state-led food waste law proposal might centralise food waste governance in Norway in the future. Therefore, it can be stated that Norway initiated food waste governance with a type II multi-level governance framework with the industry taking the lead. The industry agreements from 2015 and 2017 were very task specific, but with quite open memberships and not very clearly defined accountability of the actors in the common goals. We also observe that the Norwegian ministries, having an observer status in the agreement of intent, and becoming full members in the final agreement, brought public type I legitimacy to business-driven type II activities. It can also be seen that the industry's lead in food waste governance

created a counter proposal of a type I state-led hierarchical response in the form of a food waste law proposal debated by the Parliament. The Norwegian case illustrates that there might be significant learning processes between type I and type II activities; the food waste law suggestions were built on solid experience from the industry collaboration and could even incorporate this learning process.

The Danish case can also be seen as an illustration of type II multi-level governance of fluid, problem-focused networks but with the civic sector taking the lead. Here even more type I legitimacy was given to those type II activities as state actors began participating in various initiatives as observers, funders and project partners. This might be caused by a very strong collaboration between the leading NGO and various public entities (municipalities, ministries and legislative bodies). The high effectiveness of the food waste reduction effort in Denmark (although Denmark could initially be seen as a laggard in the comparative analysis; see Figure 13.2) also increased the output of legitimacy to this particular governance arrangement. Another key aspect might be the strong ownership displayed towards this arrangement by Danish civil society, which seems to be a subject rather than an object of food waste reduction action. As consumers are responsible for most food waste, civic engagement might also be crucial for reaching more ambitious goals after the 'lowest-hanging fruits' have been collected.

The multi-level governance analysis shows that the three countries can be put on an axis with Sweden on one end, with a state regulations and type I arrangement, Norway stretched in between with some competition between type I and type II, and Denmark being the most liberal, with strong civic activism and fluid, public partnerships governance and a strong type II legitimacy.

It is important to note that the state-centric approach is not enough to see the full food waste governance framework. All analysed countries are strongly influenced by the UN Sustainable Development Goals on food waste and their incorporation into EU regulations. The goals are the same, but Denmark, Sweden and Norway illustrate that different governance pathways are possible. There is a great deal of information exchange between all the Scandinavian and other European countries (through the Nordic Council of Ministers in Scandinavia and through the FUSIONS project in Europe). Norway looks to Sweden and Finland for policy inspiration and lessons on food waste initiatives in the hospitality sector,⁷ while Danish innovative mobile phone applications and food waste supermarkets are replicated in many European countries. Similarly, the Norwegian industry's self-regulation of food waste should also receive more scholarly and policy attention.

13.5 Conclusions and policy implications

In this chapter, we have presented the food waste governance efforts in Norway, Denmark and Sweden. We illustrate that three experimentalist

governance approaches emerged in the analysed countries: a civil society-driven framework in Denmark, a public policy-driven one in Sweden and finally an industry-driven arrangement in Norway. This shows the diverging origins of food waste regulations in the three countries, as all three sectors are in different ways involved in food waste reduction.

Learning and collaboration between the three sectors (public policy, industry and civil society initiatives), at various levels and between countries, is an important and necessary component for tackling the food waste challenge. This means a departure from the analytical mode of multi-level governance (with type I and type II arrangements) to the normative mode. Multi-level governance should also be seen as a solution for better policy implementation, public participation and involvement in decision-making, as a strategy or benchmark for good governance and effective policy for tackling food waste. Multi-stakeholder collaboration is particularly important in addressing complex social, economic and environmental problems that span across the value chains and particular ministerial competences. Our three national cases show how such collaboration might look in practice.

Denmark, with its well-coordinated mass civil society engagement to reduce food waste, has been very successful in recent years: its reductions were the largest and exceeded the pre-set targets, but it also initially had higher food waste than the EU average. Now in all countries the 'low-hanging fruits' have been collected, meaning the next targets might be more difficult to meet. There is no one-size-fits-all solution to tackle the global food waste problem, but possibilities for learning between actors and countries, to overcome weaknesses and enhance their strengths, are very important for the next stages of food waste reduction. Further studies should concentrate on best practices and lessons that could be drawn from industry self-regulation to reduce food waste in Norway, from the effectiveness of public food waste policies in Sweden, and from the successful engagement of civic society in the case of Denmark.

Notes

- 1 In Norway industry actors report food waste data but only aggregated numbers are made publicly available. In Denmark in 2016 Netto was the first supermarket chain to disclose the amount of food waste it produced. See also: Stenmarck et al., 2011.
- 2 FUSIONS was an EU-funded project with twenty-one partners in thirteen countries, running from 2012 to 2016, in which all the analysed countries actively participated. The project's aim was to reduce food waste, and to harmonise food waste monitoring in Europe. It provided the first detailed national statistics covering the entire value chain, accompanied by suggested methodology for data collection and analysis.
- 3 Lower number in Figure 13.2 in the comparative analysis does not include food waste in primary production.
- 4 Expert interview with a food waste research expert, 12 March 2018.
- 5 Expert interview with a food industry representative, 13 February 2018.
- 6 Expert interview with a food industry representative, 15 March 2018.
- 7 Expert interview with a food waste research expert, 12 March 2018.

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