
Inclusion of citizens in the food waste reduction missions in Europe and US – a comparison

Leena Kunttu*, Helka Kalliomäki, Johanna Kalliokoski, Jari Kuusisto

University of Vaasa, Wolffintie 32, FI-65200 Vaasa.

E-mail: leena.kunttu@uwasa.fi

Abstract: As the ever-increasing problems related to the food waste have both environmental and socio-economic problems, the decreasing the food waste has widely acknowledged as a grand societal challenge globally. As the major producer of the food waste, private households play a central role in this. The national innovation systems and policy makers are developing systemic tools to answer to this challenge by driving innovation across multiple sectors and actors and enable bottom-up learning and experimentation with the households. Reducing food waste programs in different parts of the world can be seen as missions where governments and policy makers aim at improving the consumers' behaviour related to food waste. The purpose of this paper is to we compare the missions that aim at reducing food waste in Europe and USA and understand how different groups of citizens have been taken into account in these missions.

Keywords: food waste, mission, grant societal challenges

1 Introduction

The food waste is a global problem. Approximately nearly one-third of food intended for human consumption is wasted all around the world. This amount of food is lost or wasted, equalling a total of total of 1.3 billion tonnes of food per year (Schanes, Dobernig and Gözet, 2018). Food waste occurs when any edible material that is intended to be consumed by humans is discarded because of consumers' purchasing decisions or retailers' and food service providers' decisions. There is also growing amount of quantitative evidence on the link between wasted food and related emissions in the food production chains (Aloysius *et al.*, 2023). As the production of food is resource-intensive, the loss of food is indirectly related to the various environmental impacts, including soil erosion, deforestation, water, and air pollution. The wasted food is also one of the major contributors to greenhouse gas emissions and in this manner one of the main obstacles to overcome in efforts to tackle climate change (Mourad, 2016; Clark *et al.*, 2020).

As the ever-increasing problems related to the food waste have both environmental and socio-economic problems (Roodhuyzen *et al.*, 2017), the decreasing the food waste has widely acknowledged as an urgent issue among governments, businesses, non-governmental organizations, academics, and the general public (Schanes, Dobernig and Gözet, 2018). The aim of the United Nations Sustainable Development Goal (SDG) 12.3

is to “halve the per capita global food waste at the retail and consumer levels and to reduce food loss along production and supply chains by 2030”.

According to the recent studies, the private households’ share of total food waste on global level is nearly two-thirds, and the levels of per capita food waste across countries and income groups are almost the same (UNEP, 2021). This indicates that managing household food waste is essential on global level (Ananda *et al.*, 2021; Aloysius *et al.*, 2023) and the governments and institutions are conducting a wide range of different interventions that aim at getting consumers and households to waste less food (Bretter *et al.*, 2023). Most of these campaigns are based on information sharing aiming at changing consumers’ behaviour through awareness-raising messages.

Major social, environmental, and economic challenges are often referred to as “grand challenges.” Grand challenges usually include environmental threats like climate change, demographic, health and well-being concerns, and the difficulties of generating sustainable and inclusive growth (Mazzucato, 2018). These problems are often complex and systemic, and they require insights from many perspectives. It is a major challenge for national innovation systems to turn these kinds of challenges into concrete problems that drive innovation across multiple sectors and actors. The needs for innovation policy development are thus characterized as transformative (Diercks, Larsen and Steward, 2019), challenge-led (Mazzucato, Kattel and Ryan-Collins, 2020), and mission-oriented (Mazzucato, 2018), all largely based on the ambitious goal of tackling complex societal challenges. Such policies require different actors (both public and private) and different sectors to innovate together. At the same time, they must enable bottom-up learning and experimentation (Mazzucato, 2018). Reducing food waste programs in different parts of the world can be seen as missions where governments and policy makers aim at improving the consumers’ behavior related to food waste.

In this paper, we compare the missions that aim at reducing food waste in Europe and USA. In the European context, we investigate European Green Deal and Farm-to-fork strategy, and in US, U.S. 2030 Food Loss and Waste Reduction Goal is investigated. The purpose of the study is to understand the similarities and differences in the food waste reduction missions on both continents, and also to analyze the impact of these missions on the level of households and citizens to understand how different user groups have been taken into account in these missions.

2 Food waste reduction missions in Europe and US

European Green Deal and Farm-to-fork strategy

Like in many other parts of the world, also within EU, most food waste occurs at the consumption stage. The leading initiative to lower food waste in EU arises from the European Green Deal that is an “umbrella” strategy to convert the EU to a climate-neutral area. The Green Deal’s goals are fresh air, clean water, healthy soil, and biodiversity, as well as healthy and affordable food. Under the Green Deal mission, the EU has initiated the “Farm To Fork” strategy to improve overall food practices that follow the general principles of having a fair, healthy, and environmentally-friendly food system. Thus, the Farm to Fork strategy strives to reduce climate change issues and lower its impact on the environment, economy, and the entire food supply chain.

In line with its commitment to the global Sustainable Development Goal Target 12.3 to halve, per capita, global food waste at the retail and consumer level by 2030, the European Union (EU) has implemented an extensive action plan to tackle this problem including regulatory and non-regulatory actions (Candea *et al.*, 2023) Since 2020 these actions have taken place under the European Green Deal's Farm to Fork Strategy. The aim of the European Commission is to propose the setting of legally binding food waste reduction targets for the EU member states to be achieved by Member states by 2030.

A key part of the strategy is also to support the development and sharing of best practices and solutions to reduce food waste across the EU. The European Consumer Food Waste Forum (ECFWF) is a pilot project that involves experts from diverse backgrounds to find tools and solutions to and identify a variety of practical, evidence-based solutions to reduce food waste at the consumer level, including households and food services. The forum has identified various intervention types to reduce consumer food waste, as well as recommendations for policymakers and other key players (Candea *et al.*, 2023). The intervention types include practical prompts, tools, and coaching for households, local awareness campaigns, classroom education, as well as national level campaigns for food waste prevention.

U.S. 2030 Food Loss and Waste Reduction Goal

In the United States, 30 to 40 percent of the food is wasted. On the other hand, more than 85 percent of greenhouse gas emissions from landfilled food waste result from activities prior to disposal, including production, transport, processing, and distribution. To reduce these emissions, there is a need to prevent food waste from being generated in the first place. U.S. federal government and local governments have recognized the importance of food waste issues, and during recent decade a variety of policies associated with food waste management, food reduction, and food donation are set to allow and incentivize individuals, organizations and businesses to reduce their food waste (Chen and Chen, 2018).

In 2015, the U.S. Department of Agriculture (USDA) and EPA announced the U.S. 2030 Food Loss and Waste Reduction goal, the first-ever domestic goal to reduce food loss and waste. The goal seeks to cut food loss and waste in half by the year 2030. By achieving this goal, U.S. could reduce its climate and environmental impacts associated with food loss and waste remarkably. At the same time, achieving this goal would improve food security and save money of the consumers and the food production chain actors. The main principle in the Food Loss and Waste Reduction Goal is to involve the food production chain actors to the mission through challenge programs called Champions. The U.S. Food Loss and Waste 2030 Champions are businesses and organizations that have made a public commitment to reduce food loss and waste in their own operations in the United States by 50% by the year 2030 (*U.S. Food Loss and Waste 2030 Champions*, no date) In May 2022, the Champions program covered over 45 food businesses representing grocery stores, restaurants, food processors, food manufacturers, food service, hospitality, and entertainment companies, who all have committed to the target of 50% reduction in food waste and loss in their operations (USDA, 2022).

Table 1 Summary of the food waste reduction programs in EU and U.S.

<i>Mission</i>	<i>European Green Deal and Farm-to-fork strategy</i>	<i>U.S. 2030 Food Loss and Waste Reduction Goal</i>
Governing body	European Commission	<i>U.S. Department of Agriculture (USDA)</i>
Goal	To lower food waste by one-third by 2030	To cut food loss and waste in half by the year 2030
Mission objectives	The EU and the EU countries are committed to meeting the Sustainable Development Goal 12.3 target to halve per capita food waste at the retail and consumer level by 2030 and reduce food losses along the food production and supply chains.	US aims at reducing food loss and waste, and together work with communities, organizations and businesses, tribal and local government, to take actions that will lead closer to achieving the national goal.
Implementation	Legally binding targets to reduce food waste across the EU, by end 2023, defined against a baseline for EU food waste levels set following the first EU-wide monitoring of food waste levels	Working with leaders in the food system (e.g., private, government, non-profit, academia, faith) to promote successful interventions and tools to advance the sustainable management of food.
Citizen engagement methods	The main interventions include tools and prompts for households, coaching for households, local awareness campaigns, classroom education programs, and national food waste prevention programs.	Individuals and communities are encouraged to reduce food waste by learning toolkits and learning materials.

3 Inclusive approaches in the food waste reduction missions

The role of inclusiveness in the innovation policy context has been emphasized during recent years. Inclusiveness refers to an approach where the aim is to decrease inequalities and strengthen the state of democracy in different parts of the world. The current innovation policies are being challenged by the need to increase their inclusiveness both in terms of processes and practices, to find solutions to increasing inequalities and to harness the ideas and agency of the diverse civil society (Mazzucato, Kattel and Ryan-Collins, 2020; Kalliomäki *et al.*, 2022). Moreover, inclusive approach to innovation policy design and delivery has several functions. Firstly, inclusiveness can be an important tool for engaging societal actors and obtaining their insights and broadening the base of innovation policy beneficiaries. Second, it also provides a way to achieve broader societal acceptance for the systemic policy, and to mobilize bottom-up agency for societal transformation. Third, inclusive approach to innovation policy design increases the likelihood of research and innovation corresponding with the needs of the end users (Von Hippel, 2017), and improves societal involvement and equity for underrepresented groups (Planes-Satorra and Paunov, 2017). Fourth, diversity of actors and viewpoints is beneficial for innovation and creativity (Nathan, 2015). With better

inclusion, the full potential of society can be utilized for the benefit of the innovation policies.

3.1. Inclusion in European Green Deal and Farm-to-fork strategy

EU Farm to fork mission and European Green Deal include many forms of involving consumers. Interventions have been implemented in the European Consumer Food Waste Forum (ECFWF) that develops tools and solutions to and identify practical solutions to reduce food waste at the consumer level. Forum developed a compendium of six different types of interventions that a wide range of stakeholders can apply to support consumers in reducing food waste both in- and out-of-home. They are: 1) Prompts and tools for households, 2) Coaching for households, 3) Local awareness campaigns, 4) Classroom education programmes and actions in school canteens, 5) Nudges out-of-home (food services), and 6) National food waste prevention programmes (Candeal *et al.*, 2023). Table 2 summarizes these interventions.

Table 2 EU Interventions to reduce food waste

<i>Intervention</i>	<i>Description</i>
1) Prompts and tools for households	Physical or visual prompts are administered at the household level. Main characteristics include simple use, affordable production, low tech and possibly 'do-it-yourself' solutions.
2) Coaching for households	Consumers receive information on food waste and how to avoid it through practical skills and knowledge
3) Local awareness campaigns	Awareness raising campaigns at local level can be multi-component interventions and extend beyond simple information provision by integrating different types of behavioural interventions.
4) Classroom education programmes and actions in school canteens	Educational materials and action plans are provided to schools to educate children through pedagogical approaches, and specific actions to reduce food waste in canteens.
5) Nudges out-of-home (food services)	Nudges used to reduce consumer food waste in out-of-home settings, such as restaurants, canteens, or retailers
6) National food waste prevention programmes	National programmes targeting consumer food waste through recurring awareness campaigns, education, and behavioural interventions to shift collective behaviour and establish new social norms.

The forum report underlines the importance of the acceptance of the interventions among the target audience, to reach that desired effect requires a systemic approach, involving relevant food system stakeholders. According to the report (Candeal *et al.*, 2023 p. 5), the systemic approach refers to the importance of considering that individual behaviours result from individual decisions influenced by external factors of different kinds (cultural, social, political, economic). For this reason, the interventions and approaches that have been designed to reduce consumer food waste must consider both individual and systemic drivers and levers. For this reason, the ECFWF recommendations underline the fact that the interventions should be chosen and designed to be effective for specific groups. For

this, different kinds of consumer segmentation approaches can be used (Bruns and Nohlen, 2023).

In addition, the impacts of the interventions implemented by ECFWF are being evaluated and monitored in detailed level as a part of the food waste reduction program, and European Commission has set specific guidelines for evaluating this (García Herrero *et al.*, 2023).

3.2. Inclusion in U.S. 2030 Food Loss and Waste Reduction Goal

As a part of the Food Loss and Waste Reduction Goal, USDA also provides guidelines and information packages to consumers and schools, how they can make simple actions to reduce food waste and loss during their daily operations related to food purchases and serving meals (*U.S. Food Loss and Waste 2030 Champions*, no date). The purpose of these guidelines is to provide materials for communities, education systems and individual households on how they can independently take actions in reducing the food waste and food loss in their daily operations.

In this U.S. context, the donation of the leftover food plays an important role. In the US, the charitable food system is comprised of regional food banks, which are the primary food procurers, and food pantries, which are the primary distributors to individuals and families with low incomes. However, the practices and regulation related to the food donations vary quite much in different states (Hudak *et al.*, 2022). To encourage the leftover food donations, the U.S. federal government has also established provisions to encourage the donation of leftover food. These provisions include liability protections and tax deductions for food donators (*USDA Donations*, no date).

4 Discussion

This study considered the huge societal and environmental challenges related to food waste. As decreasing the amounts of food waste has widely acknowledged as a grand societal challenge globally, the food waste reduction missions play a central role as systemic tools aiming to answer to this challenge by driving innovation across multiple sectors and actors. In the case of food waste, the role of private households is central, and the policy tools implemented in the food waste reduction programs should enable bottom-up learning and experimentation with the households. For this reason, the programs aiming at reducing food waste in different parts of the world can be seen as missions where governments and policy makers aim at improving the consumers' behavior related to food waste.

In this paper, we compared the missions that aim at reducing food waste in Europe and USA and tried to understand how different groups of citizens have been considered in these missions. In the case of European missions (EU Farm to fork mission and European Green Deal) there are many forms of consumer involvement. The EU programs seem to emphasize the acceptance of food waste reduction interventions among the relevant stakeholder groups, including households and consumers. The EU approach also underlines considering individual behaviours that may be affected by external factors that may be cultural, social, political, or economic, for instance. In this manner, the EU interventions and approaches are based on both individual and systemic drivers. In general, consumer involvement in EU-based approach is more systematic, and the results

are being monitored in detail. This is supported by EU funding instruments that enable research-based approach in consumer behaviour studies and monitoring. The actions and interventions in European case typically take place through EU-funded projects. It is also notable that EU-based missions often aim to develop national policies and regulation in food waste prevention. Therefore EU commission is proposing to set legally binding food waste reduction targets to be achieved by Member States by 2030.

In the case of US, EPA provides instructions and toolkits that are available for households and communities to support their food waste reduction actions. The states and cities can then decide how they use the materials and how the waste reduction goals are being met. In the US context, food donation is in central role in minimizing the food waste, and federal government and local governments have established different policy actions associated with food donation. Also, companies are voluntarily involved in the food waste reduction campaigns by participating food loss prevention champion. However, the aspects related to the inclusion, and consideration of different citizen groups are not significantly considered in the instructions given by the federal government.

5 Conclusion

In conclusion, the food waste reduction challenge is a recognized societal problem in both Europe and US, and missions have been established to tackle it in both areas. In this paper, we compared the missions that aim at reducing food waste in Europe (European Green Deal and Farm-to-fork strategy) and US (U.S. 2030 Food Loss and Waste Reduction Goal) to understand the similarities and differences in the food waste reduction missions on both continents, and especially to analyse the impact of these missions on the level of households and citizens to understand how different user groups have been taken into account in these missions. The analysis shows that in European context inclusiveness is seen as an important aspect for engaging societal actors to join the food waste reduction, and the mission aims to involve different stakeholders and groups to this process. Involving different consumer groups is executed in a systematic manner. EU also has special emphasis in the detailed monitoring of the results of the policy actions and interventions. In US context, on the other hand, the policy actions are more directly designed to general use of the households and citizens in general, and states and cities are given relatively free hands to decide how the mission targets are being implemented. In this sense, inclusiveness is not considered as a separate topic. However, in the US context the role of food donations is emphasized, and the purpose of many policy actions is to facilitate food donation, including liability protections and tax deductions for food donators. In this manner, many food waste reduction actions in US focus on helping companies, restaurants, and private citizens to donate the leftover food to those who need it. In the donation and delivery process, the role of non-profit organizations and voluntary work play a central role.

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