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sustainability REDUCTIONS
Reducing Environmental Degradation & Unsustainable Consumption Trends & Impacts On Nature & Society:
Research, Policy and Practice

Fact Sheet
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Food Waste Prevention

1. Introduction and aim

This case study focuses on the prevention of food waste along the value chain, with special focus on avoidable food losses in households. It describes resource reduction potentials based on empirical case studies in several European Union (EU) member states on national, regional and local levels. Through an exploration of the varying success of waste prevention policies it discusses policy implications and the potential for replication in other countries and sectors.

2. Description of the case

Every year about 1.2 billion tons of food waste, or roughly one third of the food produced in the world for human consumption, is generated. With about one billion people starving every day, this is not only a dire ethical situation but also a waste of resources from an environmental point of view. Environmentally, food waste leads to wasteful use of chemicals, such as fertilisers and pesticides; more fuel use for transportation; and more rotting food which creates more methane. Food loss and waste also amount to a major squandering of resources, including water, energy, labour and capital, as well as needlessly producing greenhouse gas emissions which contribute to global warming and climate change.

In Germany, for example, food products rank second in terms of highest resource use and environmental impact potential when the whole product life cycle is taken into account. It is estimated that the food sector is responsible for approximately 22% of the global warming potential in the EU. For the United Kingdom, food waste has been identified as a priority waste stream for action as it accounts for almost half of all CO_2 emissions associated with waste. The International Resource Panel points to the potential savings in land use resulting from lower food consumption through the reduction of food wastage. The share of around one-third of edible food which is lost or wasted annually across the food supply chain corresponds to around 200 Million hectars (Mha) of cropland and other resources, such as nutrients (e.g. from fertiliser) and energy, which could be saved if the amount of food waste decreased. Apart from this, almost one billion more people could be fed if global food losses were at least halved by 2025. If food waste and losses were reduced to the lowest percentage achieved in any region across the food supply chain globally, 78 Mha of cropland and 12 Million tons (Mt) of fertiliser could be saved per year. These savings would even be high enough to compensate for the expected land use expansion that will be needed in 2050 to meet growing food demand (in the low range).

In developing countries food waste and losses occur mainly at the early stages of the food value chain and can be traced back to financial, managerial and technical constraints in harvesting techniques as well as storage and cooling facilities. Thus, a strengthening of the supply chain through the support of farmers as well as investments in infrastructure, transportation, and an expansion of the food and packaging industry could help to reduce the amount of food loss and waste. In contrast, in medium and high income countries food is wasted and lost mainly at later stages in the supply chain. Thus, in contrast to the situation in developing countries, the behaviour of consumers

plays a huge part in industrialised countries.

Unfortunately the data base for food waste generation is rather unreliable and figures differ significantly between different countries inter alia because of differences of sampling and aggregation protocols. This is because the waste statistics include different parts of the total food waste generated, for example many of the national reports only include data from a specific part of the hospitality sector. This also relates to the share of so-called avoidable food waste, excluding for example parts of foods such as fruit skin, apple cores and meat bones.

For Germany a share of 35-40 kg out of 70-90 kg of food waste per inhabitant per year is estimated to be avoidable. Figures for food waste in the Netherlands indicate that about 105 kg per household per year are avoidable. The following table shows estimates for some Nordic countries, assuming that about 67% of the food waste is avoidable. When applying that same average rate for avoidable food waste for total food waste generation across

Table 1

Best estimate of total food waste and avoidable food waste in Nordic countries

Country	Total food waste (in tons/ year)	Avoidable food waste (in tons/ year)
Denmark	140.000	94.000
Finland	140.000	94.000
Norway	140.000	94.000
Sweden	260.000	174.000

Source: Marthinsen, J., Sundt, P., Kaysen, O., Kirkevaag, K. (2012). Prevention of food waste in restaurants, hotels, canteens and catering. Nordic Council of Ministers 2012.

the EU27, the total avoidable food waste in food service and catering would add up to 8.2 Million tonnes.

The food sector is one area where significant reductions in GHG emissions are possible, with food waste prevention having the potential to reduce GHG emissions by 456 million tons by 2050 in the UK alone. Estimates for 2010 show that actions to address avoidable food waste could have reduced 17 million tons of CO_2eq, which is equivalent to the emissions of 1 in 5 cars on UK roads.

3. Measured absolute reductions

A variety of initiatives and programmes have shown that the above mentioned amounts of food waste can actually be significantly reduced. Table 2 gives an overview on different measures in households, restaurants, and canteens, that have led to impressive immediate reductions.

Despite the huge potential for food waste reduction along the supply chain - from retailers and catering services to consumers - calculations on actual quantities and potential reductions are scarce. Food waste prevention initiatives are often locally organised and the results not extensively quantified. An exception to this is the UK, where the non-governmental organisation WRAP already operates a number of initiatives and surveys in order to collect specific data for food waste prevention. The detection of the above mentioned potentials with regard to waste prevention forms the basis of the WRAP campaign ‘Love Food Hate Waste', which was initiated in 2007 and aims to reduce the amount of food waste in private households. For this purpose, the programme cooperates with traders and manufacturers to support those developing individual campaigns. It also aims to gain the attention of individuals in order to increase their sensitivity towards the issue of food waste. One example of this is the way that British supermarket chains and major grocery chains introduced an improved labelling system for best-before

dates and installed packaging sizes which enable modern households to be more flexible in the purchase and consumption of groceries. At the same time, 'Love Food Hate Waste' supplies consumers with practical advice and incentives for using their groceries in the best possible way. This example shows that easily acquirable habits of waste reduction can result in significant cost savings for consumers as well as reducing environmental impacts. These habits include preparing shopping lists, meal planning, freezing products that have a limited shelf life, appropriate product storage and the creative use of leftovers.

Table 2

Prevention measures for the reduction of food waste

Name	Description	Country	Results
Eurest restaurant food waste campaign	Measurement of food waste in restaurants	Sweden	Reduction of food waste by 25% per meal in participating restaurants
Decrease trade losses through waste reduction	Reduction of food and packaging waste in the food sector through reduced offers and optimised purchase	Finland	Reduction of waste by 25% (1,000 t)
Right portion size (Menu Dose Certa)	Menu Dose Certa is a part of the project "-100kg". It has been calculated that there is potentially 100kg of waste reduction per person. It is a challenge for restaurants to find out the right portion size, but it brings with it savings in waste fees and image improvements	Portugal	In urban regions, a reduction in food waste in restaurants of 48.5 kg EW/a per person could be achieved
Green Hospitality Award Scheme	The GHA scheme is an Irish environmental certification for the catering industry. The participants are certified according to international standards. Customers can collect information on sustainable restaurants and hotels on the emerging site www.greentravel.ie	Ireland	There are a high number of members. In 2009, 6,000 t of waste reduction was achieved
Love Food Hate Waste	Awareness campaign with the goal of highlighting the importance of reducing food waste. Consumers and households get practical advice on reducing food waste, which saves them money and protects the environment	UK	Since 2008, based on WRAP's estimations, more than 137,000 t of food waste have already been prevented
Love Food Champions	81 households met regularly within a period of 4 months and exchanged experiences about food waste	UK	The average food waste generation of 4.7 kg per week per capita could be more than halved during the project
"Throw away less" campaign	Courses on reducing food waste provided for the general public, combined with a consumer survey on perceptions of food waste focussing on potentials and measures in canteens.	Belgium	According to the study, 0.3 kg of waste are produced per plate in canteens. This was reduced by 40% in the pilot project.

Source: Marthinsen, J., Sundt, P., Kaysen, O., Kirkevaag, K. (2012). Prevention of food waste in restaurants, hotels, canteens and catering. Nordic Council of Ministers 2012.

Based on these and a whole range of other activities, the UK has managed to decrease food waste generation in households by 1.2 million tons between 2007 and 2010. This accounts for 45% of the total of 2.5 million tons waste reduction. 950,000 tons of this comes from avoidable food and drinks waste. In order to be able to document changes in consumer behaviour, WRAP additionally collected questionnaires giving information about the behaviour of private households with regards to three measures: checking household supplies before shopping, planning meals over several days and preparing shopping lists before actual shopping. On this occasion, an increase by 3 to 5 percentage points in all three behaviour patterns could be registered until 2010. Moreover, the understanding of best-before dates was improved, which could also have contributed to the prevention of waste. In a consumer survey by the "Food and Drink Federation" with more than 1,000 respondents in the same year, more than half of the respondents reported that they were disposing of less groceries than the previous year.

4. Policy implications for waste reduction

The case of food waste prevention highlights two points relevant to the development of policies for a global reduction of resource consumption: 1) the limitation of monetary incentives and 2) the necessity of systemic improvements alongside the whole value chain.

1) Estimates for the UK have shown that if clearly avoidable waste production were to be completely prevented then GPB12 billion could be saved. In the Netherlands consumers throw away an estimated EUR2.5 billion a year in edible food. This is some EUR340 per household or over EUR150 per person. These figures show that despite clear and significant economic incentives consumers still tend to over-shop, to buy more than they actually need (or would be healthy). This seemingly irrational behaviour appears to be partly motivated by ever-decreasing food prices caused by lower quality food and the externalisation of environmental costs. The small share of total consumption expenses for food and the permanent availability of groceries are mentioned as causes for a decreasing appreciation of groceries. Against this background the case of food waste and the missed opportunities for its prevention might allow one to draw the conclusion that economic incentives might not be sufficient to really reduce resource consumption and that the high hopes in market based instruments might be overestimated. It seems that the relationships between resources, needs and market prices seem to be significantly more complex – especially when it comes to emotional issues like food.

2) It is not only households but also the food processing industry or retailers that should have incentives to minimise costly food losses. Here several studies identified a lack of coordination between actors in the supply chain as a contributing factor. Instead of focusing on information campaigns and only acting to raise awareness within the industry as so many countries do, in the UK the Waste and Resources Action Programme (WRAP) initiated the so-called “Courtauld Commitment’. This is a voluntary but binding agreement that obligates grocers, brand owners and producers to reduce the impact of the food industry on climate and the environment. More than 40 larger retailers, brand owners, manufacturers and producers joined during the first phase of the Courtauld Commitment. In total this represented 92% of food trade in the UK (the programme is divided into three integrative phases, with Phase 3 having started in 2013). The industry made a commitment, amongst other things, to avoid the increase of packaging waste generation completely until the end of 2008, and to achieve an absolute decrease until 2010. Since 2008, the average amount of packaging of every grocery purchased in Great Britain has decreased by approximately 4%, showing that there has been a clear reduction in food waste generation. In this case the clear identification of actors with actual influence on the value chain and the establishment of clear targets and a monitoring system seem to have been framework conditions that set incentives for real win-win eco-innovations alongside the value chain.

5. Transferability to other areas

The case of food waste prevention in the UK seems to have high transferability, especially with regards to other regions. Of course differences in the culinary culture might influence the specific reduction potentials but it has been shown that the issue of avoidable food waste generation seems to be present in all developed countries. A specific prerequisite seems to be a ban on the cheap disposal of untreated waste. In the UK, food waste prevention became a public concern shortly after the introduction of a waste disposal tax with especially high rates for food and other biogenic waste.

6. Other reflections and conclusion

The issue of food waste prevention also raises the more general question of whether consumers alone can or should be held accountable for delivering on sustainable consumption. Resulting from the failure of global resource policies (e.g. the Kyoto Protocol, the Millennium Development Goals, etc.) there has been an increasing shift of responsibilities to private domains, with slogans urging us to “Buy greener products! Consume less! Eat smarter! Don´t waste food!” Environmental education specialists have been discussing methods for motivating people to act sustainably for decades. However, there are several dangers associated with linking this with the widespread impression of political failure to establish sustainable development.

In the course of this current “privatisation” of sustainability, the public debate increasingly identifies areas of private action, as opposed to the domain of policy, as the key to solving environmental problems. The path to more sustainability is perceived as a reorientation of private action in terms of dealing with environmental goods, such as energy, water and raw materials. This assigns a political role to people in their private domains, which opposes the separation of private and public spheres in traditional and liberal systems. This is based on the premise that consumers make decisions according to their personal preferences, and not with any political intention. It is equally untrue that individuals do not have any responsibilities in environmental matters. But these responsibilities of private consumers refer to the political dimension of individual behaviour. Thus, the political power of individuals does not lie in their function as consumers, but in the engagement of individuals, groups and institutions for the ecological transformation of society.

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