The Impact of Swiss household Food Waste on Climate Change and how to reduce it

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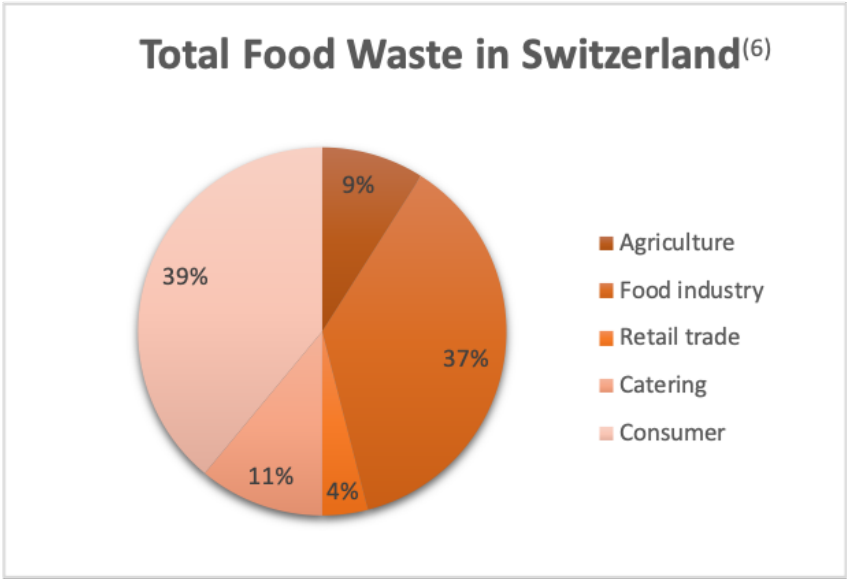

Executive Summary

Switzerland produces 300kg per capita of food waste every year. 715,000 tonnes of the yearly 950,000 tonnes of total food waste can be avoided, the majority of which comes from household consumption. This waste generates unnecessary CO_2 emissions, land and water consumption and biodiversity loss. The greenhouse gas emissions resulting from food waste, CO_2 in particular, contribute significantly to climate change and global warming. In addition, there are considerable opportunity costs associated with the removal of all this waste. As a response to this environmental harm, the Federal Council committed to reducing food waste in the Green Economy Dialogue (2013) and the UN Sustainable Development Goals (2015). However, so far there has not been a significant reduction in food waste and the pollution resulting from it. Although there have been several different proposals and initiatives to reduce Switzerland's food waste significantly. The Green Liberal Party (GLP) politician Sonja Gehrig has proposed to introduce food waste prevention as a part of the curriculum in home economics classes in Swiss secondary schools. She has also started the initiative *Aufgetischt statt Weggeworfen* which collects unsold produce from supermarkets to distribute it to those in need. I propose to carry out a study, similar to an Italian study already undertaken, on consumer behaviour in Switzerland in order to identify patterns in food waste generation. This can then help to target the groups where the most waste occurs to reduce the overall waste more effectively.

Foundational Science: Discussion & Analysis

Food waste has a tremendous global environmental, social and economic impact. 'Globally, enormous amounts of food gets wasted annually, 95% of it goes to landfills'(1). There is a global average food waste of 74kg per capita; 2019 alone saw 931 million tonnes of food waste, of which 61% came from households – that is 17% of the global food production going to waste (2). 950,000 tonnes of food are wasted every year in Switzerland, of which 715,000 tonnes are avoidable (3). Switzerland's per capita food waste is estimated at 300kg annually (4), a large portion of which is considered avoidable. It

has been estimated that '8-10 percent of global greenhouse gas emissions are associated with food that is not consumed'(2). This has a considerable effect on climate change, since greenhouse gases (GHGs) are one of the main contributors to global warming. GHGs have a naturally warming effect on the earth's temperature. One of the most important GHGs and the most effective at augmenting global warming is Carbon Dioxide (CO_2). Switzerland had 37.68 million tonnes of CO_2 emissions in 2019, that is 4.39 tonnes per capita (5). This makes it one of the countries with the least CO_2 emissions in the world; however, that is not a reason to stop efforts to reduce emissions to prevent further increases in global warming. The main consequences of climate change include biodiversity loss, land use change and rising sea levels. Global warming and climate change put huge stresses on the earth's ecosystems, which makes it one of the most pressing issues we are faced with today and one of the most important planetary boundaries. In addition, food production generates land and water consumption, as well as biodiversity loss. Depending on the region in which a certain food is grown, it will have more or less of an environmental impact. Strawberries, for example, require 62 litres per kilogramme of water if they are grown in New Zealand; if they are grown in Belarus, however, they require 2509 litres per kilogramme of water. This represents a huge stress on the environment and ecosystem services. If the food produced goes to waste, this stress on the ecosystem services is entirely unnecessary and highly destructive. 'Each stage in the production and value chain consumes more resources and generates more emissions, due to transport, processing, storage, packaging, preparation'(6). This makes household food waste especially problematic, because it happens at the end of the production chain. It signifies a waste of human, economic and environmental resources and their impact on ecosystem services without there being the benefit of people being fed. Furthermore, the costs associated with waste disposal are huge. In Switzerland, the total annual waste disposal costs amount to CHF 3 billion (4). As a result, there are considerable opportunity costs associated with food waste disposal, since this money could, for example, be spent on improving public transport links with the aim of reducing CO_2 emissions. This clearly indicates that the reduction of food

95%	wasted food that ends up in landfill(1)
74kg/capita	global average food waste(2)
17%	global food production going to waste(2)
950,000 tonnes	Swiss annual food waste(3)
300kg/capita	Swiss annual food waste(4)
61%	food waste from households(2)
8-10%	GHG emissions associated with food waste(2)

waste, especially from households, will have economic as well as environmental benefits.

Assessment of Existing Governance

In 2013, the Swiss government agreed to the Green Economy Dialogue, which was designed to protect natural resources, encourage a more environmentally friendly consumption and strengthen the circular economy. It consists of 27 measures in four key areas: consumption and production, waste products and raw materials, overlapping governance instruments and increased resource efficiency. As a part of this dialogue Switzerland has committed to reduce food waste. In 2015, Switzerland committed to the UN's Sustainable Development Goals for 2030. Under SDG 12.3, the per capita food waste resulting from consumption is to be halved and the waste occurring in the supply chain is to be reduced. However, in 2016, Switzerland still generated 6.1 million tonnes of municipal waste (7) and, as mentioned above, this is associated with enormous disposal costs.

On a more regional level, Sonja Gehrig, a member of the Canton Council of Zurich, started the organisation *Aufgetischt statt Weggeworfen* in 2015. It goes to collect unsold produce from supermarkets after their opening hours and distributes it to disadvantaged households. There are groups in 13 different areas who, as of mid-August 2020, saved more than 180 tonnes of food (8). However, this organisation only operates in the German-speaking part of Switzerland, so there is still room for improvement on a national level. Also, they only target food waste originating form supermarkets, which constitutes only a small percentage of the total avoidable food waste in the country. An attempt at tackling excessive household food waste has been made by an organisation called *foodsharing*, where people can bring baskets with food they have not eaten but are still consumable to fridges in different locations. These fridges are then open for anyone who would like to use the food to get it for free. The economic, social and environmental benefits of this are evident. The environmental impact of food waste is reduced and lower-income households are able to save money on groceries, which constitute a big proportion of their spending. Again, the work of this organisation is concentrated in the rather small area of Zurich, which means the benefits of their concept get shared only by the people in that area.

Existing Initiatives

- Aufgetischt statt Weggeworfen
- foodsharing
- Foodshelf

Another interesting approach to reducing food waste is the app *Foodshelf* which allows its users to take a photo of their excess food and put it in their virtual fridge.

Other users in the area can then stop by and collect the food for free. The app also enables users to search for specific types of food in their area. This seems to be a very adequate response in today's world where everything is becoming more digitalised and certainly has potential in the future. Unfortunately, the app is restricted to certain areas and the effectiveness of the app depends heavily on the number of users it has and on how active they are. Currently, it is only used by few people, therefore its scope is limited. As the issue of food waste and sustainability in general gets more attention from the general public, however, there might be a rise in its users, which will make the app more effective at reducing household food waste.

Governance Recommendations

The GLP politician Sonja Gehrig has suggested to include education on food waste in all home economics classes in Swiss secondary schools. This can educate children, and thus the next generation, to consume their food more cautiously and waste less. It makes sense to address the issues of food waste when teaching the students the art of cookery and show them sustainable and environmentally friendly ways of cooking and eating. However, while this argument is valid and can certainly be effective, raising awareness about avoidable food waste and its consequences will only get us so far. Education in and of itself is not enough to prevent avoidable household food waste.

An Italian study undertaken in 2019 about consumer behaviour with regards to household food waste has found that women are more prone to waste food than men. Apparently 59.4% of the country's food waste was generated by women. Furthermore, they found that consumers in the age group 31-50 waste the most food, as does the income group of 1,000-2,000€/month (9). A similar study should be carried out about the behaviour of Swiss consumers, as this can help to target specific groups that are the most problematic in terms of food waste when starting awareness campaigns. This would be more effective than targeting the entire population in the same way. For example, the Italian study found that women are more often responsible for food shopping than men and are thus more sensitive to reducing food waste. If a similar result was to be found in a study carried out in Switzerland, women could be targeted in a different way by adverts and campaigns

Recommendations

- Education on food waste prevention in schools
- Study of Swiss consumer behaviour and food waste
- Fridges for food sharing on a national level

to reduce waste, which would most likely be more effective. It would also nicely complement the education on food waste prevention in schools.
Another good example of an approach to reduce food waste that could be used on a national level can be seen in the town of Unterägeri (ZG). There is a fridge in the main square of the town where its residents can bring the still edible left overs and put them in the fridge. Other residents can then collect the food they like for free. This concept is similar to the *foodsharing* initiative and, in my opinion, should be scaled up to a national level and be supported by the cantons and communities. In this way household food waste could be reduced significantly, as left overs are shared instead of being thrown away and lower-income households will benefit economically. This scheme might also help to improve the community spirit, since it makes the residents of the same area share and work together which might improve the solidarity among them and make life in the neighbourhood more pleasant. There is already some evidence from Unterägeri that it works on a small scale. Even though there are no studies that have been carried out on this topic, according to the residents of Unterägeri, the community fridge seems to be used relatively frequently and the food that gets put into it usually gets taken out before it expires.

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