

SDG TARGET 12.3 – WHERE ARE THE STUMBLING BLOCKS?

At the midpoint of the 2030 agenda, all of the Sustainable Development Goals are seriously off track. SDG 12, with its third target of substantially reducing global food loss and waste, is no exception in this respect. A look at backgrounds, facts, knowledge gaps and some myths.

By Silvia Richter

With the adoption of Agenda 2030 in September 2015, the international community set itself the target of ensuring “sustainable consumption and production patterns” in the context of Sustainable Development Goal 12. The third target under this goal (SDG 12.3) calls for “halving per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains (including post-harvest losses) by 2030”. Then, just like today, it was assumed that globally, roughly a third of the food produced, i.e. 1.3 billion tons of food, did not get where they were meant to go, namely to the stomachs of the consumers. According to the latest available data from the Food and Agriculture

Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP) and the World Wildlife Fund (WWF), about 8 per cent of all food produced in the world is lost on the farm, 14 per cent is lost between the farm gate and the retail sector, and 17 per cent is wasted at the retail, food service and household stages of the food supply chain. These figures above all indicate one aspect: the inefficiencies in our food systems – with disastrous consequences for global food and nutrition security, for the economy and for the environment.

World-wide, more than 700 million people are chronically undernourished, and over

three billion people cannot afford a healthy diet. Wasted food pushes up food prices, and quality losses cause valuable nutrients to go lost and put food safety at risk or at least reduce it, with both raising global food insecurity. Economic damage sustained by the countries in the form of lost revenue is put globally at one trillion US dollars annually.

Our food systems are a potential threat to nature. If agriculture is not performed sustainably, it results in habitat and biodiversity loss. Seventy per cent of the water from freshwater sources is consumed by agricultural production; at the same time, more and more people are living in regions suffering from



Photo: Sumy Sadurni/ FAO

water scarcity. Areas under cultivation add up to a total of roughly 4.8 billion hectares, with around 1.6 billion hectares consisting of human or animal food crops and 3.2 billion hectares being used as pastureland. However, both the quantity and the quality of cropland and pastureland are declining. So with every gram of grain or rice rotting in the fields, in storage, or during transportation, with every banana or mango going bad in the supermarket, with every chunk of meat or fish consumers throw away, valuable and already scarce natural resources are wasted. Added to this are inputs such as fertilisers and pesticides, which not only pollute the environment but also require energy for their production. And

then, of course, there is energy consumption needed for the production process as a whole, from cultivation through harvest and storage to processing and transport, which, if it does not come from sustainable sources, contributes to global warming.

But what is more, UNEP estimates that 8–10 per cent of all global greenhouse gas emissions can be ascribed to food loss and waste. When organic material, including food, ends up in garbage, it rots and releases methane (CH₄). In its first year in the atmosphere, this gas has a 120 times higher global warming potential than carbon dioxide (which, since methane is constantly degraded through natural process-

Definitions

Food loss is the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers. Empirically, the term refers to any food that is discarded, incinerated or otherwise disposed of along the food supply chain, which starts with harvest/slaughter/catch and reaches up to, but excludes, the retail level, and the food does not re-enter the supply chain for any other productive use, such as for feed or seed.

Food waste refers to the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers.

(FAO, 2019)

es, falls to the 85-fold amount over a period of 20 years). It was not without reason that more than 150 countries signed the Global Methane Pledge, launched at the November 2021 Conference of the Parties (COP26) in Glasgow, thus agreeing to take voluntary actions to contribute to reducing global anthropogenic methane emissions by at least 30 per cent from 2020 levels by 2030. These include measures directly addressing the agricultural and food systems with their familiar methane sources, such as improving dairy productivity, animal feed production, manure management and rice production, but also measures in landfill management, e.g. by capturing methane or covering landfills in cities.

What do we know about food loss and waste?

That there is urgent need for action has also been recognised by the G20 Agriculture Ministers who, at this year's meeting in Hyderabad, India, in mid-June, committed "to prioritise reduction in food loss and waste". Why is it that at least globally, the food loss and waste figures have hardly changed for years? One of the reasons is that there is still very little reliable data available on how much food is really wasted or lost, where exactly in the supply chain these losses occur, and why. This applies not only, but above all, for the Global South, where many smallholders are involved in the agri-food value chain and where little is known about losses beyond the farm level as well as quality losses. The other reason is that different

measuring methods are employed – and don't always yield meaningful results. All this makes it extremely difficult to prioritise interventions and choose the most suitable ones.

A wide range of research papers discuss the factors influencing food loss and waste. There is no doubt that climatic conditions, such as heat and drought, humidity and lack of or excessive rainfall, are one of the major causes of losses, both pre-harvest and post-harvest. In turn, certain climatic conditions – above all heat and moisture – tend to increase the prevalence of pests and diseases. In many countries, rodents also cause high post-harvest losses. Improper harvest and post-harvest crop management techniques, lack of proper storage, especially in fruit and horticultural crops, as well as lack of transportation have also been identified as important factors behind food losses, as have poor marketing options. And all the last-mentioned reasons are of course closely linked to access to information and financial resources.

If wasted food were a country, it would be the third-largest producer of carbon dioxide in the world after the USA and China.

(WFP)

However, whereas some of these factors, such as unfavourable climatic conditions, clearly correlate with the extent of food losses, other links are less straightforward. For instance, studies of the effects on food losses of mechanisation and adoption of technology in harvesting in various value chains have yielded contradictory evidence. Studies on the influence of socioeconomic characteristics have shown that higher age levels and increasing production are frequently, albeit not always, positively correlated with food loss reduction. For gender, in turn, the results are extremely heterogenic – one survey demonstrated that being male is correlated with an increase in losses in the maize value chain, while another indicated the reduction of the same. What all these surveys do show is the importance of adequate knowledge and training when it comes to the adoption of tools and technologies. And they suggest that policies aiming at preventing and reducing food losses need to be developed context- and commodity-specific.

What can – and should – be done?

Over the last few years, most interventions to tackle food losses have concentrated on the post-harvest stage, and here, above all on storage technologies. However, the latest surveys assume that losses in production, in the harvesting process and during transportation are far higher. This can have technical reasons, for example if farmers no longer have the opportunity to dry their grain because it has been raining after the harvest, but also economic ones, if e.g. a farmer growing mango or papaya for exporting only harvests fruit meeting the quality standards of the purchasing company. If the prices on the local markets are very low, it will usually not be worthwhile for him to invest labour in harvesting the rest of the fruit.

For FAO Chief Economist Maximo Torero, one crucial aspect of successfully stemming food losses is, therefore, that the market recognises quality, which is already the case e.g. with milk or fruit. In other areas, too, observing quality standards ought to be rewarded with price premiums, for example when farmers supply maize free of aflatoxin. At retail level, economist Torero regards regulatory measures as the means of choice. Things get more difficult at consumer level, for here, behaviour change of people is crucial. Here, awareness raising is above all necessary so that consumers understand its benefits.

Improving circularity can also make a major contribution to mitigating food loss and waste, and to making our food systems more sustainable. “From waste to value” is the motto under which valuable biomass – leftovers and waste material – are converted into new raw materials. These can in turn be fed back into the agri-food systems – for instance as fertiliser, animal feed or a source of energy. In this context, “food upcycling” is also a term that is gaining popularity as a “green” consumer behaviour trend. It refers to two variants: avoiding wasting resources by putting food rests (e.g. stale bread or suboptimal fruit) to alternative use – which is commonplace in many poorer social strata in any case – or broadening the resource base by assigning parts of food which aren't used normally – such as husks and kernels of fruit and vegetables – a novel use. Here, the term “upcycling” is supposed to indicate that a value-enhancing process is involved – as opposed to “recycling”, which, in its conventional sense, implies “downcycling”. Very much along these lines, Pete Pearson, Senior Director, Food Loss and Waste at WWF, would like to see more people recognising



A labourer downloading and washing tomatoes in Bangar el Sokor, Nubaria, Egypt. Reducing food loss in the horticultural sector is critical to simultaneously supporting the transition towards a diet with higher consumption of vegetables.

Photo: FAO

that “food and organic material is not a waste which has zero value”. If one trusts current statistics, only 10–12 per cent of organic material is put to circular economy or composted world-wide, while the rest goes to landfills. So here, Pearson is convinced, there is a potential to create a whole new marketplace.

Final reflections

It used to be assumed that food production, storage and transportation losses are mainly a problem of developing countries and that consumer food waste is concentrated in high-income countries. Very recent surveys by UNEP have put this assumption into perspective (see Box). One of the reasons for this is



Reducing food loss and waste is one of the major drivers for making space for nature.

Pete Pearson, Senior Director,
Food Loss and Waste at WWF

that economic development leads to changes in lifestyle and eating habits. So whereas locally adapted technologies in harvesting, food processing, (cold) storage and logistics, together with the corresponding information, capacity building and financing options are likely to reduce food losses in the countries of the Global South, various factors going hand in hand with the increasing development of precisely these countries will have a tendency to result in more waste. For example, rising income levels enable people to handle food more “generously”, since not everything has to be used up for scarcity reasons. In addition, more affluent societies often have higher standards regarding food aesthetics. And frequently, they are also more aware of the risks food may bear and will perhaps prefer to throw food away for “safety reasons”. Increasing urbanisation linked with the trend towards smaller households can lead to less time being left for targeted shopping and the tedious process of cooking food. Another trend this is linked to is eating out. Restaurants and canteens have to operate economically. Moreover, with regard to reducing food waste, they are confronted with conditions – as well as customers’ expectations regarding sustainability. In addition, they are able to buy food in bulk quantities, combine it tailored to



A maize storage facility in Uganda .

Photo: Sumy Sadurni/ FAO

requirements and re- or upcycle it. While all this can help reduce waste, the trend towards eating out is also linked with consuming ultra-processed food, which in turn is associated with negative health outcomes.

However, higher income and more affluence are also coupled to a more sustainable lifestyle. Here the question arises what ultimately has a greater net effect – consumer enthusiasm and convenience or sustainability awareness and consciously doing without. Moreover, the encouraging trend towards a “green lifestyle” results in chemicals and plastic disappearing more and more from the food chain. But making do without packaging, in particular, can lead to higher losses in transportation when vulnerable crops are concerned. Here, the development of environmentally friendly packaging

can make a crucial contribution, especially if organic waste material is used to produce it.

Last but not least, every intervention must consider which actors it benefits in the food value chain – and which ones could lose out. Rising food prices, which are regarded as one of the most important incentives to reduce waste, can lead to the food and nutrition security of the poorer groups in society worsening. So reducing food loss and waste is, and will remain, a multifaceted and complex issue requiring accurate cost-benefit and cause-and-effect analyses.

Silvia Richter is an editor of Rural 21. She would like to thank the members of the Rural 21 Editorial Board for their valuable input for this article.

Key findings from UNEP’s Food Waste Index Report 2021

- Around 931 million tonnes of food waste was generated in 2019, 61 per cent of which came from households, 26 per cent from food service and 13 per cent from retail. This suggests that 17 per cent of total global food production may be wasted (11 per cent in households, 5 per cent in food service and 2 per cent in retail).

- Household per capita food waste generation is found to be broadly similar across country income groups, suggesting that ac-

tion on food waste is equally relevant in high, upper-middle and lower-middle income countries. This diverges from earlier narratives concentrating consumer food waste in developed countries, and food production, storage and transportation losses in developing countries.

- Previous estimates of consumer food waste significantly underestimated its scale. While data doesn’t permit a robust comparison across time, food waste at consumer level

(household and food service) appears to be more than twice the previous FAO estimate.

- There is insufficient data on the edible fraction of food waste to allow comparative analysis across country income groups, but even if inedible parts (bones, pits, eggshells, etc.) predominate in lower-income countries, there is sufficient total food waste in these areas for circular approaches or other food waste diversion strategies to be important.