



# SIANI

Swedish International Agricultural Network Initiative

## Reducing food waste across global food chains

Policy Brief

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A selection of fruit and vegetables at Östermalmshall in Stockholm.  
Photo by Jon Åslund / Flickr

About a third of edible food produced worldwide is wasted, at a cost of about US\$750 billion per year. Reducing this waste can achieve a “triple win”: save money, enable us to feed more people without increasing production, and decrease pressures on the climate, water and land resources.

The Sustainable Development Goals (SDGs) recognize food waste as a major problem, and under Goal 12.3, “Ensure sustainable consumption and production patterns”, they set a target to halve per capita global food waste at the retail and consumer levels by 2030, and reduce losses along production and supply chains.

Many efforts to reduce food waste are under way, but much more remains to be done. This policy brief focuses on the global dimension of food waste: how actions and choices made in high-income countries that import food (particularly fruit and vegetables) affect producers – and food waste – in poorer countries, and how technology and practical measures could make a difference.

The analysis is based on research by the SIANI Expert Group “Food Waste Prevention Strategies for Global Food Chains”, as well as a workshop with experts and stakeholders held in Jönköping in April 2016. A main focus is on ways for Swedish actors to drive positive change in global supply chains.

### How does food waste happen?

Food waste and losses occur for many reasons. In high-income countries, the greatest losses occur in the retail and consumption parts of the supply chain. In low-income countries, food waste occurs mainly on the way from the farm to consumers. For example, a 2011 study by the UN Food and Agriculture Organization (FAO) found that in sub-Saharan Africa, 9% of the edible parts of fruits and vegetables were lost in post-harvest handling and storage, 25% in processing and packaging, and 17% in distribution.

The EU-financed project FUSIONS has identified nearly 300 drivers of food waste across the supply chain, which we classify into five rough categories:

### Key findings and recommendations

- Research on food waste is still an emerging field, and there is much we do not know about how supply chains function, how much food is wasted, and the causes of food waste. The more intermediaries there are in supply chains, the less transparent they often are, as information gets lost along the way. Therefore, global food chains are particularly challenging to improve.
  - There is growing demand for political action to reduce food waste, but more resources are needed for education and training, technology implementation, better infrastructure and communication. This is particularly important in trade with poor farmers in developing countries.
  - Collaboration and dialogue are crucial, to ensure that existing knowledge and best practices are shared, identify unmet needs, and develop a joint agenda. Researchers, innovators, food processors, retailers and policy-makers need to come together in an organized way.
  - The research community has a key role to play in the fight against food waste – but to be useful, the research should focus on real-life challenges faced by producers, and highlight low-cost solutions such as mobile phone apps, packing methods to maintain the quality of tropical fruit, ways to use inedible parts and unavoidable waste, and processing technologies suited for small-scale applications.
  - Swedish stakeholders can contribute in many ways: universities can educate students and host guest researchers; NGOs can provide support in developing countries; supply-chain actors can host trainees from producer countries and teach them Swedish best practices; and innovators can develop simple, robust technological solutions to be used in developing countries.
  - Practical solutions for reducing food waste need to build on the collective experience and knowledge carried of actors across the supply chains, working together with researchers to address concrete problems related to food. This requires a “bottom-up” approach.
  - It is crucial to develop systematic data collection and reporting in order to quantify waste streams, provide comparable figures for different countries and companies, and set targets for improvement.
  - Although work on food waste is hampered by the unclear ownership of the issue and lack of collaboration, there is always a “working window” for each actor in the supply chain to make improvements. The many examples provided by stakeholders is proof of engagement and optimism.
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- **Inherent characteristics** of food products and how they are produced and consumed (e.g. highly perishable, unpredictable supply and demand)
  - **Social factors and dynamics** that are not easy to change (e.g. single-person households, families with young children, increased consumption of meals out of home)



*It is important to find ways to use leftover prepared foods, including cut-up fruit and vegetables at salad bars, which often go to waste. Photo by Shihmei Barger / Flickr*

- **Individual behaviours and expectations** that are not easy to change (e.g. wanting fresh, good-looking produce; wanting foods independent of place or season)
- **Conflicting priorities** of private and public stakeholders (i.e. reducing food waste is less important than cutting costs, increasing sales, ensuring food safety, etc.)
- **Structural problems**, such as non-use or sub-optimal use of available technologies, organizational inefficiencies of supply chain operators, inefficient legislation, and consumer behaviours attributable to lack of awareness or information.

It is in that fifth category where we see great opportunities for action in global food chains. Policy-makers in high-income countries have a key role to play, but it is important to note that they cannot solve problems alone. Measures need to be tailored to the specific context, and have to be developed collaboratively.

Communication is particularly important to identify and address problems in one part of the supply chain that cause waste somewhere else. For example, if a fruit is damaged during transport, it may not spoil until it reaches the retailer. Conversely, if a buyer cancels an order at the last minute, a farmer may not be able to sell his produce on time, and it will go to waste.

This study focused on the edible parts of food, but it must be stressed that both edible and inedible parts should be used as efficiently as possible. Inedible parts and edible parts that become unusable for human consumption can be used for animal feed or biogas production, for example.

### How can we reduce food waste?

In Sweden and around the world, there is growing interest in reducing food waste. Many initiatives and projects are working to increase knowledge of the issue, raise awareness, and foster collaboration across the food supply chain to reduce food waste.

Aiming to gather insights from Swedish experts and food supply chain stakeholders, we conducted a survey in March–May 2016. We contacted 150 people, and received 24 responses with a wealth of information and ideas. Below we highlight examples of good practice provided by respondents.

### Solutions directed towards global food chains

- **Fairtrade and similar certifications** provides traceability all along the supply chain, and may reduce food waste by improving farming practices and boosting producers' incomes.
- **Supermarket buying policies** can be adapted to reduce waste; for instance, prompted by an NGO report, Tesco, which had required Kenyan bean farmers to trim both ends of each bean, agreed to require only one trim. This reduced waste by 30% and boosted farmers' incomes.

Both these solutions have a strong policy dimension and build on bilateral agreements with producers in developing countries. In labelling systems, a third-party organization is involved as well, overseeing the certification approach. Increased transparency of supply chains and traceability are crucial to reducing food waste.

### Solutions in European food chains with potential global impact

- **Banning unfair trading practices**, as the UK has done, can protect suppliers from harmful actions such as late cancellations of orders, and also reduce waste. If such regulations could be agreed on globally, late cancellations might decrease, which would have an impact on food losses as well as on the income of the farmers in developing countries.

- **Selling ugly fruits** is a local choice that makes a statement about what constitutes high-quality fruit and avoids waste by reducing how much ugly produce is discarded.



*Persuading consumers to buy ugly or imperfect produce, such as tomatoes and peppers at a Memphis, U.S., farmers' market, is an important strategy for reducing food waste. Photo by Memphis CVB / Flickr*

• **Technical solutions** such as improved packaging, secured cold chains (to maintain the optimal temperature from producer to retailer), and dynamic “best before” dates that adapt to the way a product was handled, can all reduce waste, but require investments in technology and capacity-building.

• **Logistical solutions** such as improved demand forecasting and stock management, better understanding of the causes of food waste, and improved quality management can reduce waste in any food supply chain.

#### Solutions at later stages of the chain

• Strategies for handling **surplus and leftover food** (e.g. donating to charity, selling prepared foods, reducing prices) can reduce waste in the country of consumption, and can inspire people in developing countries as well, particularly those with growing waste at the retail and consumer levels.

• Producing **animal feed from food waste** is an important strategy within Europe. It may not be directly applicable in global food chains, but could inspire locally tailored solutions in other countries.

In addition to these examples of ongoing activities, Swedish food supply chain actors highlighted the importance of education, suggesting that sustainability, food production, resource efficiency and food waste reduction be taught from year one in primary school.

Knowledge-sharing and awareness-raising were also identified as priorities, with a focus on now-neglected issues such as the importance of appropriate packing solutions, optimal temperatures and humidity levels for storing different fruits and vegetables, and optimal handling methods.

Overall, there was a sense that food waste needs to get more attention and be higher on the political agenda, with clearly stated goals and strategies. They also stressed that policies and strategies need to be coordinated, to avoid conflicts with other policy realms. And they called for increased investment in technology in global food chains, educational projects and collaborative projects.

#### The value of cooperation

Asked how cooperation can support efforts to reduce food waste, stakeholders offered numerous ideas. For example, industry associations could coordinate efforts to reduce food waste. Dialogue could facilitate mutual learning and make it easier for different actors to understand the value of reducing waste. Actors in similar situations – e.g. kitchen managers in hospitals or hotels across Europe – could share ideas.

Cooperation could also help ensure that food waste reduction efforts take a holistic perspective, stakeholders said. And it could help offset the imbalance of power in European supply chains, which are now dominated by major retailers and large brand manufacturers. By coming together, particularly with small suppliers and farmers at the table, more equitable contracting terms could be agreed.

In order to facilitate cooperation and dialogue, the SIANI Expert Group organized a full-day workshop on 22 April 2016 at the Swedish Board of Agriculture (Jordbruksverket), in Jönköping. A dozen participants attended, from government, academia and NGOs. The Expert Group’s conclusions and recommendations are informed by the day’s discussions.

#### Priorities for action

A key insight from this study and the workshop is that there are large knowledge gaps that we need to fill, and much of the knowledge that exists is not shared along the supply chain. Roundtable discussions and knowledge-sharing across sectors could help begin to address these gaps and provide a platform for collaboration and developing a joint agenda.

To facilitate and enable actions to reduce food waste, resources are needed for education and training, technology implementation, better infrastructure and communication across the food system. This is important in particular when trading with developing countries and poor farmers.

A third priority is transparency. A great deal of information is lost along the food supply chain, especially when working with developing



At a market that sells fruit, vegetables and prepared foods, among other products, waste is hauled away for composting. Photo by Letitia Baker / Flickr

countries, where suppliers may have limited ability to be a strong partner compared with the large companies that purchase their products.

Finally, it is crucial that policy-makers work in tandem with food supply chain actors to address food waste. A policy framework is needed, setting a direction and goals, and then resources need to be provided to support actions along the supply chain.

The political agenda must include global aspects, and not just domestic ones; not only are food chains global, but high-income countries such as Sweden have both the resources and the know-how to promote change towards resource-efficient food chains. They can also sponsor research to close knowledge gaps.

Another issue that deserves attention is the business model between retailers and their suppliers. Many of the solutions to the food waste problem demand changes in business models – for example, bread producers often take back unsold bread at a low cost, removing incentives for retailers to do better.

### Opportunities for action

#### In Sweden:

A national knowledge hub on food waste, linking to other resources, could serve as a “one-stop shopping” source of information. Swedish universities and institutes, meanwhile, could take a role in educating students and hosting guest researchers to work on closing knowledge gaps. SaMMa, a Swedish collaboration on food waste established as part of a government project, can serve as an open forum for sharing information from a Swedish perspective.

NGOs, for their part, could have an important role as facilitators and educators in developing countries. And supply-chain actors could host trainees from developing countries, so they can learn Swedish best practices.

Swedish researchers and innovators could also contribute to technology development, in particular simple, robust technological solutions to be used in developing countries. Low-cost options such as mobile phone apps, improved packing methods, ways to use inedible parts and unavoidable waste, and processing technologies suited for small-scale applications would all be helpful.

#### Within Europe:

• The EU's **Circular Economy Package** on food waste aims to support achievement of the SDG targets for food waste reduction across the EU. The European Commission is developing a common methodology to measure food waste, and it is creating a platform for Member States and food chain actors to identify measures to reduce food waste, share best practices, and facilitate cooperation. The **European Platform on Food Losses and Food Waste** was established in 2016 to support this effort. Although it focuses on the EU, the broad range of participants has the potential to make a global impact.

[http://ec.europa.eu/food/safety/food\\_waste/eu\\_actions\\_en](http://ec.europa.eu/food/safety/food_waste/eu_actions_en)

• **Horizon 2020** is a seven-year EU research and innovation programme (2014–2020) with a key role to play in building research and innovation capacity. It may offer opportunities to collaborate with other European countries as well as selected countries (e.g. in Asia and Africa). One funded project, **REFRESH** (2015–2019), has brought together several major partners and has a strong web and social media presence.

<https://ec.europa.eu/programmes/horizon2020/> and <http://eu-refresh.org>

#### Global initiatives:

• The **Global Initiative on Food Loss and Waste Reduction** (Save Food) was launched by FAO in 2011 to build capacity and support networking worldwide. It had four pillars: advocacy; collaboration and coordination; policy, programme and strategy development based on evidence; and technical support to investment projects and programmes. Its **Think.Eat.Save** campaign aims to catalyse action in different sectors to reduce food waste, provide practical advice, and serve as a platform for exchanging ideas and examples of effective projects and actions.

<http://www.fao.org/save-food> and <http://www.thinkeatsave.org>

• **Feedback**, based in the UK, is an environmental organization that campaigns to end food waste all across the food system. It works globally with governments, international institutions, businesses, NGOs, grassroots organizations and the public to change society's attitude toward wasting food, and has produced several important reports.

<http://feedbackglobal.org/about-us/>

• **Champions 12.3** is a coalition of executives from governments, businesses, international organisations, research institutions, farmer groups, and civil society focused on raising ambition, mobilizing action, and accelerating progress toward achieving Target 12.3. The coalition aims to lead by example, motivate others, raise awareness and advocate for innovation, investment, better information, and increased capacity to reduce food loss and waste.

<https://champions123.org/>

• **YieldWise** is a \$130 million initiative from the Rockefeller Foundation that aims to demonstrate how the world can halve food loss by 2030. The initial focus is on fruits, vegetables, and staple crops in Kenya, Nigeria, and Tanzania, where up to half of all food grown is now lost.

<https://www.rockefellerfoundation.org/our-work/initiatives/yieldwise/>

*This policy brief is based on the 2016 technical report **Food Waste Prevention Strategies in Global Food Chains**, by Karin Östergren and Emma Holtz, of RISE Agrifood and Bioscience, Sweden. The report was a product of the SIANI Expert Group on Food Waste.*

*The views and content in this document are the authors' own, and do not necessarily represent the views of SIANI or its members or partners*



SIANI's mission is to enable sustainable food security and nutrition for all. SIANI is a member-based network that supports and promotes Swedish expertise and provides an open and interactive platform for engagement and dialogue in a global context



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