# Global food waste crisis demands urgent action and innovation



Around one-third of all food produced globally is wasted, according to experts, posing significant economic and environmental challenges. This issue is especially critical in urban areas, where it is projected that by 2050, 80% of the world’s food will be consumed. The substantial levels of food waste undermine food system sustainability and squander vital resources such as water, land, energy, labour, and capital.

The financial implications of food waste are considerable, with global costs estimated at approximately £770 billion annually. In addition to economic losses, food waste is a major contributor to climate change. In 2022, over one billion tonnes of food — equivalent to more than one billion meals a day — were wasted worldwide, generating around 10% of global greenhouse gas emissions. Methane, a potent greenhouse gas produced by food waste, has a warming effect 25 times greater than carbon dioxide over a century.

Efforts to reduce food waste have formed part of international sustainability goals. In 2015, European Union member states committed to United Nations Sustainable Development Goal (SDG) 12.3, aiming to halve food waste by 2030. Yet, investment in food waste reduction remains low globally, with only about $0.1 billion spent annually in 2019/20, far short of the estimated $50 billion needed.

Different causes of food waste are evident across regions. In Western countries, waste predominantly occurs in shops and households. Initiatives such as smart refrigerators and food-sharing platforms like Too Good To Go are being adopted to address surplus food. Furthermore, the acceptance and sale of ‘wonky’ vegetables through subscription services such as Odd Box are gaining popularity to reduce waste from cosmetic standards in supermarkets.

Conversely, in many developing nations, a significant amount of food waste happens before food reaches consumers, often due to inefficient handling, poor storage, and pest infestation leading to spoilage. Zachary Tofias, director of food and waste at C40—a global network of cities sharing sustainable practices—highlights that in these regions, a third of food is wasted at this stage. Although digital technologies such as field sensors monitoring environmental conditions exist to curb losses, their application is uneven. For example, China leads in Internet of Things (IoT) technologies related to agriculture, while India, with a similar scale of fruit and vegetable production but lower GDP, applies these technologies less extensively.

Recent technological advancements, including artificial intelligence (AI), are being applied across the supply chain to tackle food waste. AI helps retailers forecast demand more accurately, which can reduce surplus food. However, Tofias emphasises that technological solutions must be complemented by policy and collaboration involving local authorities and the private sector. He stresses that local governments can play a vital role by fostering platforms for engagement and education about food waste prevention.

Examples of innovation include Barcelona’s foodbank at Banc del Aliments, where food waste is sorted: edible surplus is donated to NGOs for producing items such as jams and broths, while inedible waste is composted. Milan operates a network of five food waste hubs collecting surplus food from supermarkets and redistributing it to people in need. In 2022 alone, four of these hubs recouped 400 tonnes of food. The hubs’ establishment was a collaboration between the City of Milan, Cariplo Foundation, Polytechnic University of Milan, and Assolombarda, the business association. According to Tofias, Milan’s success stems from strong stakeholder relationships, progress monitoring, and local government efforts to educate citizens on food waste.

On a policy level, Malachy Mitchell, managing director of food and agribusiness consultancy Farrelly Mitchell, notes that effective food waste reduction strategies typically combine regulation, incentives, and public engagement. He cites South Korea as an illustrative example, where a landfill ban and a pay-by-weight system have increased the amount of recycled food waste from 2% to 95% over 30 years. Seoul employs approximately 6,000 bins equipped with scales and Radio Frequency Identification (RFID) technology that weigh food waste and charge residents accordingly. These measures reportedly reduced food waste in the city by 47,000 tonnes over six years. Residents can also purchase biodegradable bags mandated by law for food waste disposal, which cover 60% of the associated collection and processing costs.

Despite these successes, Mitchell acknowledges widespread obstacles such as inadequate data collection. Only 12% of countries have waste management tracking systems, with the majority operating without actionable data. Changing ingrained behaviours related to convenience and cultural norms also presents a considerable challenge. Mitchell says, “Public awareness campaigns alone prove insufficient to shift habits rooted in convenience or social norms.”

Some countries have made significant strides. France launched a National Pact to Combat Food Waste in 2013 and passed the Garot Law in 2016, requiring retailers to partner with food aid organisations and establish food donation monitoring protocols. In New York City, the Food Portal within its donateNYC app connects food donors with organisations, saving nearly 80 tonnes of food from landfill in its first year.

In Oakland, California, the East Bay Municipal Utility District’s wastewater treatment plant processes food scraps from restaurants and supermarkets, converting waste otherwise destined for landfill into renewable energy. Nelsy Rodriguez, EBMUD’s public information representative, explains: “There are so many natural resources in the wastewater... We saw a real opportunity to use those resources for fertiliser or to generate biogas.” Each year, EBMUD produces around 27,000 MWh of energy from resource recovery and is exploring ways to expand this initiative.

In the global south, innovative preservation technologies are being trialled to mitigate food loss. Nairobi’s city markets, for example, face unreliable electricity, contributing to high levels of food spoilage due to inadequate cold storage. A pilot scheme introduced portable cold storage powered by solar panels capable of adapting to weather conditions. An expansion of this system across Nairobi’s city markets could potentially prevent approximately 21,613 tonnes of food waste.

Experts assert that effectively addressing food waste requires a transition from linear waste paradigms to circular economy models. Achieving meaningful change involves all stakeholders and a combination of regulatory action, infrastructure investment and community engagement. Mitchell advises local governments to conduct comprehensive baseline studies to understand food waste sources, then develop multi-faceted strategies that include mandatory waste segregation and incentives for food redistribution.

Rodriguez adds, “We pay for waste to be taken away from us every week... but what we do with our waste is a huge global issue.” The approaches being pursued worldwide reflect diverse, evolving methods aimed at reducing food waste’s environmental and social impacts while harnessing emerging technologies and collaborative frameworks.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

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* <https://www.un.org/en/observances/end-food-waste-day> - The United Nations notes the 2015 commitment by EU member states to Sustainable Development Goal 12.3 to halve food waste by 2030, validating the article's reference to international sustainability goals addressing food waste.
* <https://www.theguardian.com/environment/2023/sep/24/food-waste-uk-consumers-supermarkets-climate-crisis> - This article discusses how in Western countries most food waste occurs at retail and household levels and highlights initiatives like smart refrigerators and apps akin to 'Too Good To Go,' backing the article’s points on regional differences and solutions for food waste.