A Playbook for Reducing Food Loss and Waste in Latin America and the Caribbean

Water and Sanitation Division

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#SinDesperdicio

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Contents

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4

Summary

Food loss and waste (FLW) is a challenge affecting the Latin American and Caribbean region economically, socially, and environmentally. In 2015, nations of the world agreed to halve rates of retail and consumer food waste and dramatically reduce rates of food loss during production and the rest of the supply chain by 2030. Governments and companies in the Latin American and Caribbean region have an important role to play in achieving this ambitious goal—and in so doing strengthen food security, tackle climate change, and improve people's livelihoods and financial well-being.

To reduce FLW, governments and companies can implement the simple but effective "Target-Measure-Act" approach. In this approach, a country or company (1) sets a FLW reduction **target**, (2) **measures** its current levels of FLW (and periodically re-measures to assess progress), and (3) **takes action** to reduce the hotspots of FLW.

This **Playbook for Reducing Food Loss and Waste in Latin America and the Caribbean** is designed to help governments and businesses in the region pursue practical efforts to tackle the FLW challenge. It is designed to inform, inspire, and support decision-makers and their analysts in government agencies and companies based in Latin America and the Caribbean. This Playbook draws upon and, in places, reproduces (with prior approval of the authors) research and text from the report **Reducing Food Loss and Waste: Setting a Global Action Agenda** (Flanagan et al. 2019). This Playbook builds upon that report by providing context and case studies relevant to Latin America and the Caribbean.

This publication begins by answering "why care about food loss and waste?", "why is now a historic opportunity?", and "what is the Target-Measure-Act approach?" It continues by articulating practical steps to implementing the Target-Measure-Act approach. In particular, it explains how to set a FLW reduction target and how to begin measuring FLW. It then provides three recommended steps for countries to kick-start action and a "to do" list for the private sector—tailored to each stage in the food supply chain. It concludes by outlining the support that the #SinDesperdicio partnership can provide to governments and businesses on this journey.

The food system challenges highlighted by the global pandemic reinforce that action to reduce FLW is urgently needed. There is no more time—or food—to waste.

Sources for this publication

In places, the **Playbook for Reducing Food Loss and Waste in Latin America and the Caribbean** reproduces text from previous publications authored by some of the present publication's co-authors. In particular:

- Sections I, II, and III, as well as the "Act" recommendations for companies in section IV reproduce text and tables from the report **Reducing Food Loss and Waste: Setting a Global Action Agenda** (Flanagan et al. 2019).

- The first two "Act" recommendations for countries in Section IV (and the accompanying table) reproduce text from the report **Reducing Food Loss and Waste: Ten Interventions to Scale Impact** (Hanson et al. 2019).

The Playbook elaborates on these for the Latin America and Caribbean context and provides novel case examples.

6

Why care about food loss and waste?

According to the latest available data, about 8 percent of all food produced in the world is lost on the farm, 14 percent is lost between the farm gate and the retail sector, and 17 percent is wasted at the retail, food service, and household stages of the food supply chain (FAO 2018; UNEP 2021; WWF-UK 2021). This huge level of inefficiency has significant impacts.

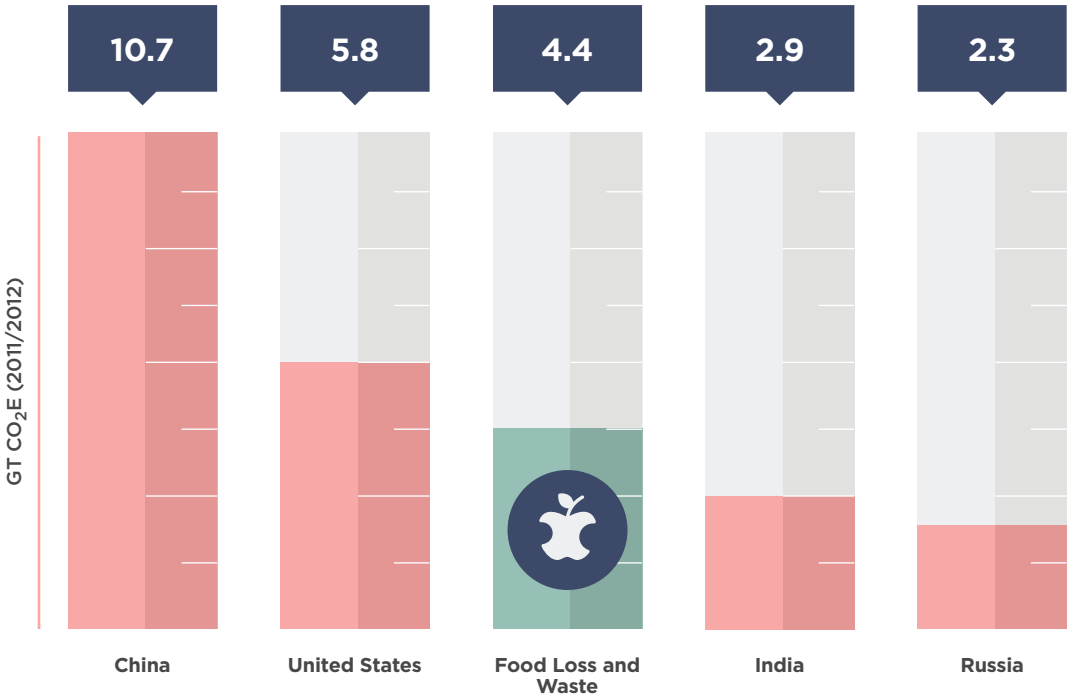
Consider food security. In some areas, food loss during production or during handling and storage is predominant. This can affect the ability of farmers to make a good living and, at times, feed their families. In other places, food waste near the end of the supply chain can affect household nutrition and spending. Regardless of where the food loss and waste occur, in a world where nearly 1 in 10 people is undernourished (FAO 2018), it is a travesty that more than 2 billion tonnes of food each year never gets consumed (WWF-UK 2021). Moreover, as demand for food production rises with a growing population, the world needs to make the most of what is already grown now more than ever.

Consider the economic costs. FLW results in roughly US$940 billion in economic losses globally per year (FAO 2015). For example, Colombia's rate of FLW is approximately 34 percent of its total food production (32 kg of food waste per capita per year), which is equivalent to economic losses of US$5.4 billion/year (Colombia Departamento Nacional de Planeación 2016). Investing in FLW reduction efforts can therefore reap significant economic benefits. For example, one study found that food providers such as canteens, hotels, and restaurants can experience up to a 14-fold return on their investment in food waste reduction programs (Hanson and Mitchell 2017).

Consider the environment. Food that is harvested but ultimately lost or wasted in Latin America consumes about 5 percent of the global water footprint associated with food loss and waste (FAO 2019). The global production of food that is ultimately lost or wasted requires a land area greater than that of China (FAO 2013). Moreover, FLW generates about 8-10 percent of global greenhouse gas emissions annually (IPCC 2020). To put this in perspective, if FLW were a country, it would be the third largest greenhouse gas emitter on the planet—surpassed only by China and the United States (Figure 1). In fact, reducing FLW by half would avoid 1.5 gigatons of carbon dioxide equivalent emissions per year by 2050, an amount greater than the current energy-related and industry-related emissions of Japan (Searchinger et al. 2019).

In light of these impacts, reducing FLW can generate a triple win. It can help feed more people. It can increase savings for farmers, companies, and households. And it can reduce the food system's pressure on the environment.

FIGURE 1
If Food Loss and Waste Were Its Own Country, It Would Be the Third Largest GHG Emitter



Note: Figures reflect all six anthropogenic GHG emissions, including those from land-use change and forestry (LULUCF). Country data are for 2012 while the food loss and waste data is for 2011 (the most recent data available). To avoid double counting, the food loss and waste emissions figure should not be added to the country figures.

Source: CAIT 2015; FAO 2015.

8

Why is now a historic opportunity?

In September 2015, a historic window of opportunity opened to elevate the issue of FLW reduction on the global agenda. At the United Nations General Assembly, countries formally adopted a set of 17 Sustainable Development Goals (SDGs) as part of the 2030 Agenda for Sustainable Development: global goals to end poverty and hunger, protect the planet, and ensure prosperity for all populations and generations (UN 2017).

SDG 12 seeks to "ensure sustainable consumption and production patterns." The third target under this goal ("Target 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 postharvest losses) by 2030 (Box 1). This ambitious target has the potential to embed the reduction of FLW firmly in public-sector and private-sector strategies around the world for the first time. It is truly a global target, and highly relevant to Latin America and the Caribbean as one of the main food-producing regions of the world. Although solutions may differ, every country, company, and individual has a role to play.

> **"By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including postharvest losses."**
>
> **SDG Target 12.3**

BOX 1
About Food Loss and Waste

The difference between food loss and food waste is not always sharply defined. However, a distinction is sometimes made to reflect different underlying causes. FAO (2021) uses the following definitions:

- **Food loss:** the decrease in the quantity or quality of food resulting from decisions and actions by food supply chain actors from the production stage up to, but excluding, retailers, food service providers and consumers.

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

Food loss and waste can take a variety of forms along the food supply chain (Figure B1).

FIGURE B1
Examples of Food Loss and Waste along the Food Supply Chain

FOOD LOSS			FOOD WASTE	
PRODUCTION	HANDLING & STORAGE	PROCESSING & PACKAGING	DISTRIBUTION & MARKET	CONSUMPTION
During or immediately after harvesting on the farm	**After leaving the farm for handling, storage, and transportation**	**During industrial or domestic processing and/or packaging**	**During distribution to markets, including at wholesale and retail markets**	**In the home or business of the consumer, including restaurants and caterers**
• Fruits discarded due to bruising during picking • Crops sorted out postharvest for not meeting cosmetic standards • Crops left behind in fields due to poor mechanical harvesting or drops in prices • Fish discarded during fishing operations	• Harvested food eaten by pests • Harvested food degraded by fungus or disease • Fish that are spilled or degraded after landing	• Milk spilled during pasteurization and processing • Food sorted out as not suitable for processing • Livestock trimming during slaughtering and industrial processing • Fish spilled or damaged during canning or smoking	• Food sorted out due to quality • Safe food disposed of because of going past sell-by date before being purchased • Food spilled or damaged in market	• Food sorted out due to quality • Food purchased but not eaten • Food cooked but not eaten

Source: FAO and UNEP, 2016.

10

What is the "Target-Measure-Act" approach?

Governments and companies can pursue a simple but effective "Target-Measure-Act" approach to reduce FLW (Flanagan et al. 2019). With this approach, a country or company (1) sets a FLW reduction **target**, (2) **measures** its current levels of FLW (and periodically re-measures to assess progress), and (3) **takes action** to reduce the hotspots of FLW.

1. Target: Targets set ambition, and ambition motivates action. Governments and companies therefore should adopt an explicit FLW reduction goal aligned with SDG 12.3—a 50 percent reduction by 2030.

2. Measure: The adage "what gets measured gets managed" holds true for FLW. Quantifying FLW within borders, operations, or supply chains can help decision-makers better understand how much, where, and why food is being lost or wasted. This information provides an evidence-based foundation for prioritizing interventions to reduce FLW, and helps entities monitor whether they are on track to achieving their targets. Governments and companies therefore should begin measuring FLW and monitor their progress toward reducing it over time.

3. Act: What ultimately matters is action. Governments and companies should pursue actions to reduce the "hotspots" of FLW that were identified by measurement.

Target-Measure-Act is used widely and successfully by governments and companies that are working towards the reduction of FLW. The European Union and the United Kingdom, for instance, follow this approach.[i] The latter, in fact, has achieved a 27 percent reduction in FLW over the past 15 years (WRAP 2020). Major food businesses are following this approach, as do members of The Consumer Goods Forum and The Global Agribusiness Alliance (Lipinski 2020).

11

What is practical guidance for pursuing "Target-Measure-Act"?

Getting started on Target-Measure-Act is straightforward.

Setting a target

A country's or company's target should be a 50 percent reduction in FLW by 2030.[1] This level of ambition is consistent with the UN Sustainable Development Goals (i.e., SDG 12.3) and with reductions needed to help the world meet the Paris Agreement on climate change. These reductions also would generate significant financial savings for companies active in food supply chains (Hanson and Mitchell, 2017). Although the SDG base year is 2015, countries and companies may use a different base year if credible data is not available for 2015.

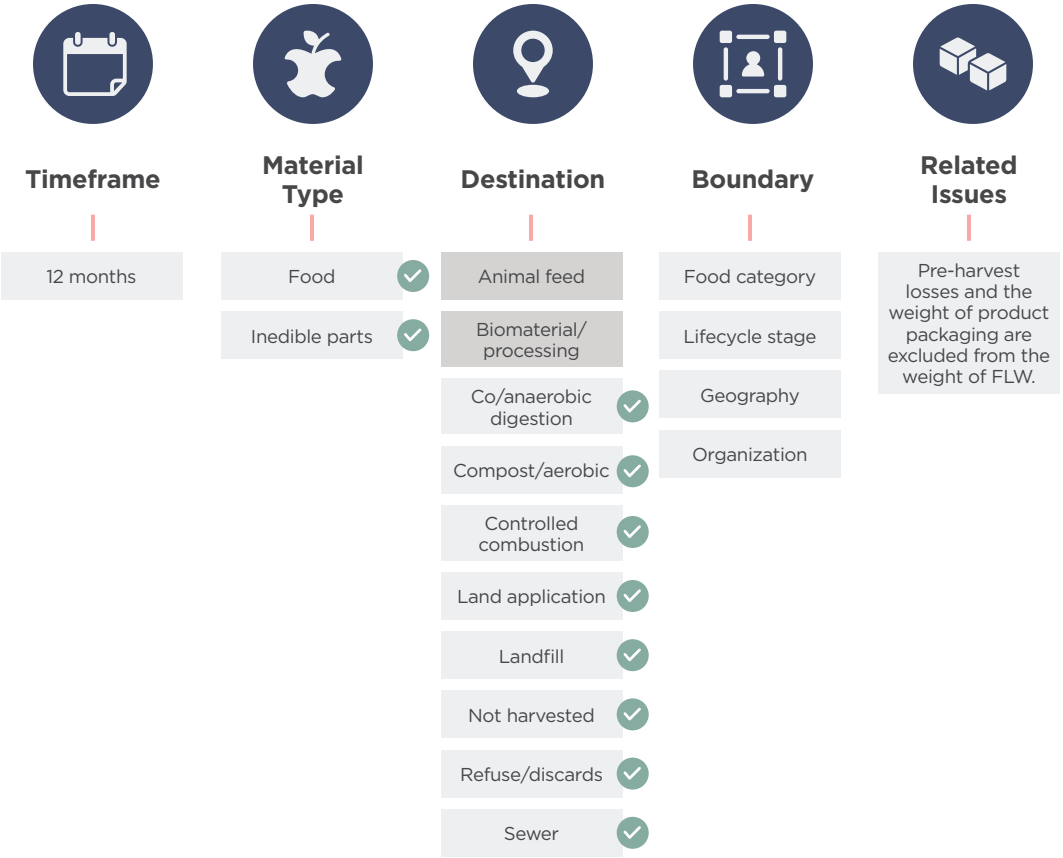
For countries
For countries, the 50 percent reduction target should reflect the percent reduction in kilograms (kg) of FLW per person per year (FLW/person/year). For instance, if a country had a FLW rate of 100 kg/FLW/person in 2015 and a rate of 50 kg/FLW/person in 2030, then the country would have reduced its FLW by 50 percent, meeting the target.

For companies
For companies, the 50 percent reduction target should reflect the percent reduction in tons of FLW per the annual amount of food produced or handled by the company.[ii] For instance, if a company lost or wasted 100 tons of food in 2015 while handling or producing 1000 tons of food that same year, it would have a 10 percent FLW rate. If that company then lost or wasted 75 tons in 2030 while producing or handling 1500 tons of food that same year (i.e., a 5 percent FLW rate), then the company would have reduced its rate of FLW by 50 percent, meeting the target.

Figure 2 outlines the recommended scope of the target for countries and companies. Food or inedible parts that terminate in any of the highlighted destinations are considered FLW. For more information about the scope, see the Food Loss & Waste Accounting and Reporting Standard (FLW Protocol, 2016).

[1] SDG 12.3 applies the 50% reduction target only to per capita food waste and does not provide a numerical target for food loss. However, in the spirit of targets motivating action, the authors believe that countries should apply this 50% target across the entire food supply chain and thus to both food loss and food waste.

FIGURE 2
Recommended scope for food loss and waste reduction targets and measurement (countries and companies)



Note: This recommendation on defining "FLW" is consistent with the approach proposed by FAO, UNEP and the European Commission for country-level reporting, except that these two organizations also exclude "not harvested/plowed-in" due to data availability (FAO) and due to regulatory constraints (EU Commission). However, both recognize the importance of this category, and a number of studies indicate that there may be a great amount of loss/waste happening at this stage (WWF 2018).

Source: Adapted from FLW Protocol 2016.

Measuring

Countries and companies typically use various data sources and methods to quantify their FLW. An available resource for selecting and applying 10 commonly used quantification methods is the Food Loss and Waste Accounting and Reporting Standard and the companion document, Guidance on FLW Quantification Methods. These publications provide guidance for a country or company on how to select the appropriate quantification method(s) and on how to calculate FLW data.

For countries

Several approaches are available for countries to measure their national-level FLW. For instance, countries can apply the sampling methods developed by FAO and UNEP to quantify national-level food loss and food waste, respectively (Box 2). For

a more detailed identification of FLW hotspots, a country could use methods that capture a greater share of food moving through a country's supply chains, such as the **Food Waste Reduction Roadmap Toolkit** developed by WRAP, which is used in the United Kingdom.

BOX 2
National measurement

Food Loss Index

FAO is custodian of the SDG 12.3 food loss indicator, the **Food Loss Index**, which tracks food losses occurring within a country from farm gate up to, but not including, food retail. The estimate for a country is based, at a minimum, on annual data about losses for 10 key food commodities produced in that country. In the absence of new directly measured data, the Food Loss Index makes use of a model that provides loss estimates based on existing data and factors from the scientific literature and can be updated annually based on nationally collected data. Although it provides a general overview of country-level loss, these estimates can be less accurate than directly measuring losses. For this reason, FAO has developed methodological and technical guidance on how a country can directly measure food loss data. The initial results of the Food Loss Index can be found here: **http://www.fao.org/3/CA2640EN/ca2640en.pdf**. Guidance on measuring food loss using the Food Loss Index can be found here: **https://elearning.fao.org/course/view.php?id=605**.

Food Waste Index

UNEP is custodian of the SDG 12.3 food waste indicator, the **Food Waste Index**, which tracks food waste occurring at the retail, food service and household stages of the food supply chain. The Food Waste Index provides estimates of food waste at country-level based on modeling and most relevant existing data for those countries that have not yet measured food waste, as well as a detailed set of steps for how countries to collect, analyze and report their own food waste data. The initial results of the Food Waste Index, as well as the recommended methodology for country-level measurement, can be found here: **https://www.unep.org/resources/report/unep-food-waste-index-report-2021**.

For companies
Most companies use a mix of data sources and methods. In some cases, data on the amount of FLW may already exist (e.g., where FLW is separated from other material streams). In other cases, a company may be able to estimate the amount of FLW by using stocking data, scanner data, storage records, and other sources that enable the company to compare the amount of food purchased or generated against the amount sold (with the difference being FLW). Companies may also identify existing sources of data by tracking the generation of FLW and identifying where it goes (i.e., its destination) via waste collection receipts or other data sources.

Taking action

There are many actions that can be taken to reduce FLW. The following highlights several priority actions for countries and companies.

For countries
Three priority actions for countries are: (1) develop a national FLW strategy, (2) create a national multi-stakeholder collaboration on FLW, and (3) explore and pursue a handful of "no regret" FLW reduction policies.

1. **Develop a national food loss and waste strategy.** A national strategy for reducing FLW serves as a plan of action for achieving overall prevention and reduction of FLW within national borders. Such a strategy should include a suite of programs, policies, practices, incentives, and/or other related measures to influence the actions of farmers, companies, consumers, and political bodies in order to achieve the country's reduction target. A national strategy has the potential to align public policies, private sector actions, farmer practices, and consumer behavior toward a common target. However, for it to be effective, a national strategy needs to be supported by the government as well as affected sectors (Box 3), backed by sufficient resources (financial, human, and legal), and monitored for follow through. Moreover, the convener (e.g., government agency, national non-profit) of the entities developing the national strategy should be accountable for execution of the strategy.

   A solid national strategy should incorporate the Target-Measure-Act approach. The "Target" should affirm the nation's commitment to SDG 12.3. With respect to "Measure", the strategy should define what is considered FLW, how it should be measured, and the periodicity of measurement. Regarding "Act", the strategy should describe who needs to do what, including specifying which actor-specific interventions should be prioritized. National strategies should seek to engage nearly all relevant actors within a nation. Table 1 recommends features of a national strategy on FLW reduction.

BOX 3
Law 1990 in Colombia

In 2019, Colombia passed Law 1990 which establishes a National Policy Against Food Loss and Waste (Política Contra la Pérdida y el Desperdicio de Alimentos). The law created a FLW hierarchy and tax code to incentivize FLW reduction and food donation, and it assigned an interagency commission (CISAN) the task of developing specific regulations and incentives to mobilize both producers and consumers on how to best reduce FLW (Broad Leib et al. 2021).

To develop Law 1990, jointly designed by the food banking sector along with the Colombian legislature, Colombia first measured FLW across its entire supply chain from farm to fork, following FAO methodology and guidance. The country held a series of technical workshops with government agencies and private-sector food companies to better identify the primary causes and hotspots of FLW across specific industry sectors and geographic regions. These efforts culminated in a National Planning Department report which estimated that 34 percent of all available food for human consumption (and up to 60 percent of fruits and vegetables) are lost or wasted each year in Colombia—with 64 percent of this occurring during production, handling, and storage (Gaviria et al. 2016).

Although Colombia has yet to formally set a national FLW reduction target aligned with SDG 12.3, Law 1990 establishes the initial steps to measure the country's FLW, identify its root causes, and frame how the government, civil society, and the private sector can take action to reduce Colombia's FLW.

TABLE 1
Recommended Features to Include in a National Food Loss and Waste Reduction Strategy (Not Exhaustive)

THEME	FEATURE	COMMENT
Target		Set a target consistent with SDG 12.3 (50 percent reduction by 2030). As suggested in Reducing Food Loss and Waste: Setting a Global Action Agenda (Flanagan et al. 2019), the authors recommend that the 50 percent reduction apply to both food losses and food waste, and cover from the point that crops and livestock are ready for harvest or slaughter through to the point when they are ready to be ingested by people.
Measure	Scope	Select the scope of what should be measured. The scope includes what types of material are to be considered "food loss and waste," what destinations of that material are to be considered "food loss and waste," and the geographic and organizational boundaries to consider (e.g., food loss and waste that occurs within national boundaries). Champions 12.3 published a guidance note that recommends the best practice for countries in achieving SDG 12.3 (Hanson 2017), advising that the "halve per capita" apply not just to food waste (as written in SDG 12.3) but also to food losses (i.e., preretail food waste). Moreover, the guidance note recommends that the scope cover from the point that crops and livestock are ready for harvest or slaughter through to the point that they are ready to be ingested by people. Chapter 1 in Flanagan et al. (2019a) provides some recommendations on setting a scope.
	Methods	Recommend which quantification methods public, private, and research sector actors should use. Given the complexity of the issue and variations in data and resource availability, no single method will likely be appropriate. The FLW Standard (Food Loss and Waste Protocol 2016) outlines 10 quantification methods (or combinations of them) that are possible.
	Base year	Select a year for the first quantification of food loss and waste against which the reduction target will be applied and future progress measured. Ideally this year would be as close to 2015 (the start of the SDGs) as possible in light of data availability.
	End year	Select the final year of quantification. Ideally this should be 2030 in order to match the time period of SDG 12.3.
	Milestones	Recommend some measurable milestones of progress along the way between the base year and the end year. These milestones might include percentage of reduction to date, share of private sector engaged, number of new public policies implemented, and so on.
	Frequency	Determine how many quantifications will occur between the base year and the end year. Optimal periodicity of quantification is between every other year and every five years (in order to allow actors to take corrective action after seeing results).

Measure	Entities	Recommend which entities should measure their food loss and waste. At a minimum, the national government should measure food loss and waste that occurs within national borders. This can be done with assistance of national research institutions and/or FAO and UNEP. Cities should consider measuring. Likewise, large companies active in the national food supply chain should measure their food loss and waste.
	Public reporting	Require that the results of each measurement be publicly reported in order to raise awareness of the issue, celebrate progress, enable benchmarking, and motivate further action where progress is not being made. Stakeholders will appreciate transparency on the issue, and this can foster greater collaboration and joint problem-solving.
Act	Actors-specific interventions	Based on country-specific evidence and conditions, articulate which of the actor-specific interventions described in Figure 3 are to be prioritized, supported, and realized. In other words, give initial recommendations on interventions that actors can take during harvesting, storing, processing, marketing, and consuming food.
	Public policies	Articulate which public policies are to be implemented to support food loss and waste reduction. In addition, articulate the process by which public policy impacts will be evaluated and refined over time.
	Public-private partnerships	Recommend the formation of a public-private partnership to help with implementation of many aspects of the strategy. Articulate aspired membership and activities of the partnership. See scaling intervention #2 in this publication for more details.
	Investment	Recommend the amount, type, and sources of investment needed to implement the strategy.
	Governance	Delineate clear roles and responsibilities for implementing the national food loss and waste strategy.

Source: Reproduced and updated from Hanson et al. 2019

2. Create a national multi-stakeholder collaboration to reduce FLW. In a multi-stakeholder collaboration, relevant actors (e.g., government agencies, companies, research institutions, civil society organizations) agree to jointly tackle FLW within a country (Box 4). Participants preferably should include national agriculture and environment ministries/agencies, local government representatives, food-related businesses (e.g., producers, manufacturers, retailers, restaurants, hospitality companies) active in the country, non-governmental organizations that work on FLW, and research institutions that bring topical expertise. These sorts of multi-stakeholder collaborations are effective at the municipal level (Box 5), as well as the national level.

Multi-stakeholder collaborations are an important component of tackling FLW for several reasons:

• **They bring the private sector and public sector together.** The reduction of FLW requires actions from the private sector, complemented by enabling public policies. The private sector is particularly critical in markets where it is a major player in food production, distribution, and sales. The public sector can provide policies, infrastructure, and incentives that can facilitate private sector action.

• **They facilitate action across the entire food supply chain.** Reducing FLW often requires a "whole food supply chain" approach. Multi-stakeholder collaborations can reach farmers that are all the way "up" the supply chain and consumers that are all the way "down" the supply chain.

• **They enable sharing of strategies and best practices among actors facing similar problems.** Such pre-competitive sharing and joint problem solving that occurs in a multi-stakeholder collaboration can accelerate the implementation of FLW reduction measures and can make them more cost-effective.

BOX 4
Multi-stakeholder Platform in Argentina

In 2018, the government of Argentina enacted Law 27.454 to create a national plan to reduce FLW and meet the ambition of SDG 12.3. This law granted authority to the Ministry of Food and Bioeconomy to develop public policies and programs that will prevent FLW in Argentina. To help facilitate the private sector's support in this effort, the government modified Law 25.989, which added greater protection to food donors and intermediaries from lawsuits when donating food.

The government also established a national FLW network in 2016 comprised of (as of the time of publication) 150 private-sector, non-profit, and civic organizations to regularly meet and review best practices, policy changes, shared challenges, and potential areas of collective action on FLW. These meetings have worked to identify and build consensus on key FLW priorities for the country—such as expanding food donation infrastructure, standardizing FLW measurement and reporting, and mitigating FLW hotspots like fresh produce. To help address this hotspot, the Argentine government partnered with the Inter-American Development Bank, IBM Argentina, and the Argentine Network of Food Banks to hold a contest, #SinDesperdicioHortícola, to fund and provide mentorship to organizations with innovative ideas that can reduce on-farm and post-harvest food loss.

This network is also organized by Working Groups (WG) to tackle different causes of FLW per sector. Currently there is an Industry and Retail WG which gathers most of the big companies of food, beverages, and retail in order to measure and share best practices; a Universities WG to raise awareness and promote research in this sector; and a Municipalities and Local Governments WG was recently created to incentivize local policies on FLW. Finally, the Ministry of Agriculture, Livestock and Fisheries is particularly working to promote the reduction of FLW in small and medium enterprises in the context of a larger program for competitiveness and value added for this sector.

BOX 5
Food Redistribution in São Paulo, Brazil

Since 2017, the city government of São Paulo has run a program to reduce the city's FLW and increase the availability of fresh fruits and vegetables for vulnerable residents facing food insecurity. The program—originally called "São Paulo Fighting Food Waste"—begins the process by collecting produce at street and municipal markets that is in good condition and safe to consume, but that has lost some of its aesthetic or commercial value. This produce is then redistributed to welfare recipients registered with the Municipal Bank Food Program (São Paulo City Hall 2020).

The city also formalized FLW reduction through a municipal decree, the "Program to Combat Food Waste" (Covas 2019). The program is focused on food recovery and donation, with an added emphasis on FLW prevention by promoting improved supply chain practices around food storage and transport. It also aims to double the number of staff working in food transportation logistics to 200 people and to expand the city's compost program from 170 markets (which each divert roughly one ton of food per week) to at least 360 markets by 2022 (AMLURB 2019).

3. Explore and pursue a handful of "no regret" FLW reduction policies.

Government policies on food loss and waste reduction (and their implementation) can be grouped into four broad categories: public infrastructure, policy and legal instruments, fiscal incentives, and institutional frameworks.[iii] Although priorities vary by country and circumstance, governments can implement "no regret" policies in each of these categories that would make significant progress on FLW reduction regardless of context. These include:

Public infrastructure

• Develop, facilitate, promote, and/or improve climate-smart infrastructure (e.g., roads, electricity, irrigation, community storage, sustainable cooling and cold chains) and access to it, especially for farmers who live far from markets.

• Embed into agricultural extension services (and in farmer subsidy programs) food loss reduction awareness, technical assistance, and financial aid.

Policy and legal instruments

• Implement policies to prevent unfair business practices (e.g., last-minute order cancellations and unilateral or retroactive changes to contracts).

• Remove barriers to food redistribution via policies (e.g., liability limitations, tax breaks) thereby making it easier for food suppliers to donate safe (but unsold) food to charities.

• Promote food redistribution by training health inspectors to provide guidance on safe donation practices during inspections of food service venues.

• Support and implement policies to standardize food date labeling practices to reduce confusion about product safety and quality, and improve consumer understanding of the meaning of date labels.

• Make target-setting, measurement and reporting of food loss and waste by large companies mandatory.

Fiscal incentives and disincentives

• Introduce taxes on food loss and waste for large companies.

• Introduce landfill bans or taxes to discourage the disposal of food waste at landfill and promote more circular approaches.

• Create financing instruments and product lines (e.g., funds, bonds, loans) dedicated to reducing food loss and waste.

• Include food waste reduction criteria in public procurement policies.

Institutional frameworks

• Implement policies and programs within agencies with the proper authority and purview to carry them out.

• Implement policies and programs at the most appropriate level of government (e.g. national, regional, local).

For companies

There is no single "silver bullet" action for companies—or for any private actor including farmers and consumers—to reduce FLW. Reducing it at scale requires numerous private actors throughout the food supply chain to do their part, implementing a variety of context-specific interventions. The following section offers FLW reduction priority "to do" lists for each type of private actor per stage of the food supply chain. These "to do" lists consist of initial "no regrets" steps that would kick-start FLW reduction efforts and are consistent with recommendations in the FAO Code of Conduct on Food Loss and Waste (FAO 2021). They are not intended to be exhaustive; private actors should be creative in generating solutions.

• **Production:** Food losses during harvesting can result from a wide range of factors, including damage incurred during harvest, failure of harvesting methods to capture all of the available crop, high production (e.g., labor) costs relative to market prices, and lack of an economically viable market for surplus food (e.g., food does not meet cosmetic requirements or is in excess if an order has been canceled), among others. Figure 3 outlines a "to do" list for key actors during the production stage of the food supply chain, namely crop farmers, fishers, and ranchers.

FIGURE 3
Priority "To Dos" by Private Actor (**Production**)

PRODUCTION	HANDLING & STORAGE	PROCESSING & PACKAGING	DISTRIBUTION & MARKET	CONSUMPTION
Crop Farmers	• Improve harvesting practices (e.g., ensure product is harvested at the right maturity and use appropriate harvesting equipment to maximize yield while minimizing crop damage). • Improve skills or use tools to better schedule harvesting (including accessing better data on weather). • Engage customers (e.g., wholesalers, retailers) to communicate implications of order changes. • Engage customers to explore changes in quality specifications to enable more of what is harvested to be sold. • Identify financially viable alternative markets or use for crops otherwise left in the field (e.g., value-added processing, donation, secondary surplus markets).			
Fishers	• Use fishing gear designed for target species to reduce bycatch. • Identify (or create) markets for unavoidable bycatch (e.g., animal feed or processed products).			
Ranchers & Animal Farmers	• Build capacity in practices to reduce losses (e.g., reduce milk spills, minimize contamination). • Implement best practices in animal welfare to avoid stress and injuries that can reduce the shelf life of meat from animals.			

Source: Flanagan et al., 2019

• **Handling and storage:** Food losses during handling and storage can result from a wide range of factors, including careless handling, pests, inadequate reduction of heat and moisture during storage, vibration of vehicles on bad roads, lack of cold chain infrastructure, delays at border crossings, and disruptions due to weather, among others. Figure 4 outlines a "to do" list for key actors during the handling and storage stage of the food supply chain, namely farmers, packinghouses, storage providers, and transportation providers.

FIGURE 4
Priority "To Dos" by Private Actor (**Handling and Storage**)

PRODUCTION	HANDLING & STORAGE	PROCESSING & PACKAGING	DISTRIBUTION & MARKET	CONSUMPTION

Primary Producers	• Crop farmers: Improve training in best practices (e.g., handling to reduce damage, drying, fumigation treatments, and on-farm processing). Establish aggregation centers that provide adequate storage and preservation options, such as cooling chambers. • Fishers: Improve temperature management, handling, and preservation techniques (e.g., fenced-off landing beaches or drying racks to improve the quality of fish and to minimize losses). • Ranchers and animal farmers: Improve handling and preservation options (e.g., establish milk collection centers with cooling tanks). Improve conditions during transportation of food-producing animals from farm to markets.
Packinghouses	• Adopt best practices to provide the clean, cool, and/or dry conditions required to reduce postharvest losses. • Reexamine handling and storage practices to reduce damage (e.g., use liners in wood and basket containers, reduce the size of sacks or crates to minimize product damage). • Build near-farm facilities to convert unmarketable crops and by-products into value-added products.
Storage Providers	• Use storage containers that protect against temperature variations, humidity and precipitation, and insect and rodent infestation. • Adopt low-cost storage and handling technologies (e.g., hermetic grain storage bags, plastic or metal silos, plastic crates) that prevent spoilage and increase shelf life. • Work with intended users and community experts to design and produce locally relevant storage solutions.
Transportation & Logistics Providers	• Improve handling practices during loading and unloading. • Use technology innovations to improve the flow of information (e.g., about road and traffic conditions, as well as timing of pickup and delivery) to optimize movement of food. • Introduce (or expand) energy-efficient, clean, low-carbon cold chains from farm to wholesalers. • Work upstream with customers to provide planning tools and handling and storage technologies that help them reduce losses. • Create access to alternative markets for products that cannot be marketed.

Source: Flanagan et al., 2019

• **Processing and packaging:** FLW during processing and packaging can result from factors including poor management of inventory, inaccurate forecasts, human errors and interruptions during food processing, residual food not used during product line changeovers, and product or package defects. Figure 5 outlines a "to do" list for key actors during the processing and packaging stage of the food supply chain, namely food manufacturers, slaughterhouses, and packaging providers.

FIGURE 5
Priority "To Dos" by Private Actor (**Processing and Packaging**)

PRODUCTION → HANDLING & STORAGE → **PROCESSING & PACKAGING** → DISTRIBUTION & MARKET → CONSUMPTION

Processors & Manufacturers	*Operations-related:* • Improve training of staff to reduce technical malfunctions and errors during processing. • Reengineer production processes and product design to reduce waste during product line changeovers. • Introduce software and related information and communications technologies to optimize operations (e.g., to identify waste, track temperature and ensure freshness, assess ripeness, better balance demand and supply forecasts, and accelerate delivery of food). *Customer-related:* • Use product sizes and packaging that reduce waste by consumers (e.g., accommodate desire for smaller or customizable portions). • Standardize date labels (e.g., eliminate "sell by" and use only "use by" for perishable items and "best before" for others) to reduce consumer confusion. • Develop new food products or secondary uses (e.g., animal feed or other value-added products) from what cannot be marketed (e.g., spent grains, fruit trimmings, vegetable peels). • Seek donation of excess food that is still safe to consume (e.g., revise vendor agreements with retailers to allow for donation instead of mandatory destruction).
Slaughterhouses	• Ensure that proper temperature management conditions are maintained. • Follow best practices in cleaning and sanitation to reduce losses due to contamination. • Fully leverage potential for using animal by-products to safely manufacture other products (e.g., animal feed supplements). • Identify and address management practices that lead to avoidable losses (e.g., using remote video auditing to assess whether best practices are being implemented).
Packaging Providers	• Invent, design, produce, and mainstream packaging options or coatings (e.g., resins used on pouches or on foods) that extend a product's shelf life. • Offer packaging that is resealable to allow for incremental consumption and to extend how long the remainder of a product stays suitable for consumption. • Provide commercial customers with a greater variety of packaging sizes to help shoppers purchase the amount appropriate for their needs. • Adjust packaging so it is easier for consumers to empty all the contents.

Source: Flanagan et al., 2019

• **Distribution and market:** FLW during wholesale and retail can result from factors including poor handling, not storing or transporting product at the right temperature, equipment malfunctions, overstocking due to an inadequate assessment of supply and demand (or fear of empty shelves), and disposing of unsold food, among others. Figure 6 outlines a "to do" list for key actors during the distribution and market stage of the food supply chain, namely food wholesalers and food retailers (formal and informal).

FIGURE 6
Priority "To Dos" by Private Actor (**Distribution and Market**)

PRODUCTION → HANDLING & STORAGE → PROCESSING & PACKAGING → **DISTRIBUTION & MARKET** → CONSUMPTION

Wholesalers	• Build capacity for better handling and storage practices to reduce mistakes that result in food loss. • Expand cold storage systems during wholesale and logistics to protect products vulnerable to heat damage. • Find food rescue partners or establish online marketplaces that facilitate sale or donation of rejected shipments or short-life products. • Use backhauling (or other logistics solutions) to enable return of reusable storage containers or rescue of surplus food for people in need. • Invest in technologies to track temperature and ensure freshness, streamline routing, track movement of goods in and out of warehouses, and monitor food loss and waste.
Retailers (formal)	*Operations-related:* • Improve training of staff in temperature management, product handling, and stock rotation. • Optimize inventory management systems (and increase flexibility in supplier contracts) to better match forecasting and ordering. • Review cosmetic specifications and accept a wider diversity of produce. *Consumer-related:* • Enable consumers to purchase smaller or customized portions (e.g., through bulk bins or staffed seafood and meat counters). • Adjust promotions to avoid excessive purchase of additional items (e.g., offer half off or mix-and-match deals rather than two-for-one offers). • Redesign in-store merchandising to avoid excessive handling of products by consumers (e.g., sort by stage of maturity), and to achieve the desired appearance of abundance but with less damage and excess product (e.g., through smaller bins and bowls). • Educate consumers about better food management (e.g., proper storage, meal planning, understanding date labels, safe food handling, cooking tips).
Retailers (informal)	• Participate in groups or associations of informal operators to access guidance and training in best practices in food handling and storage. • Take advantage of municipal support to access clean water, storage areas, equipment that improves food safety, and training in how to reduce food contamination. • Use practices that minimize damage such as handling produce gently, stacking properly (e.g., to avoid bruising delicate produce), marking cases to track inventory, and rotating stock following a "first-in–first-out" method. • Ensure that displays allow air to be circulated and temperature conditions to be appropriate for product to remain fresh (e.g., high-ethylene producers should be kept away from ethylene-sensitive commodities). • Avoid sprinkling unclean water on products (to minimize wilting and shriveling) as such practices result in unsafe foods shunned by buyers.

Source: Flanagan et al., 2019

• **Consumption:** FLW during consumption, whether from a company's or consumer's perspective, can result from inaccurate planning of what will be consumed, portion sizes that are too large, mistakes during preparation, fears related to food safety, and improper handling and storage, among other factors. Figure 7 outlines a "to do" list for key actors during the consumption stage of the food supply chain, namely households, restaurants, hotels, food service providers, and canteens at public and private institutions.

FIGURE 7
Priority "To Dos" by Private Actor (**Consumption**)

PRODUCTION	HANDLING & STORAGE	PROCESSING & PACKAGING	DISTRIBUTION & MARKET	CONSUMPTION

Households	• Buy only what you expect to eat: check refrigerator and cupboards before shopping, use a shopping list, and plan meals in advance. • Know the difference between "use by" (which is about food safety) and "best before" (which is about quality and still safe to eat after this date). • Freeze or preserve food before it spoils, and find out how to best store different foods so they stay fresh and safe longer. • Find creative ways to use leftover ingredients and products past their peak quality (e.g., in soups, sauces, smoothies), as well as to cook the parts you may not normally eat (e.g., stems, cores). • Organize the kitchen and refrigerator so that items do not get lost and spoil.
Restaurants	• Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, reward staff who deliver against targets). • Shift away from preparation methods such as batch cooking, casserole trays, and buffets to reduce overproduction and repurpose excess food (e.g., offer customers "doggy bags," safely incorporate unused items into other dishes, sell excess food at a discount, donate unsold food). • Revisit inventory management and purchasing practices (as well as menus) to better fit needs based on historical trends and waste data. • Use scales in the kitchen to weigh food and track items most commonly wasted (and estimate the financial cost of food disposed, thus creating a financial signal to waste less). • Consider whether portions served exceed what can be eaten, and rethink promotions that encourage overpurchasing by customers.
Hotels	• Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets). • Rethink the buffet (e.g., shift certain items to à la carte near end of mealtimes, reduce the size of dishes used in buffets). • Reduce overproduction by producing smaller quantities of items consistently left on the plate. • Repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it). • Communicate to guests about food waste and encourage them to take only as much as they need.

Catering/Food Service	• Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets). • Reduce the amount overproduced (e.g., by producing smaller quantities of items that are consistently underconsumed). • Repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it). • Use scales in the kitchen to weigh food and track items most commonly wasted (and estimate the financial cost of food disposed, thus creating a financial signal to waste less). • Evaluate contractual obligations between clients and suppliers that generate waste and overproduction (e.g., contracts that stipulate that all hot dishes must be available for the full-service period).
Public & Private Institutions (e.g., schools, hospitals, government canteens)	• Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets). • Reduce the amount overproduced (e.g., by producing smaller quantities of items that are consistently underconsumed), and repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it). • Introduce techniques to minimize people taking overly large portions (e.g., trayless dining, flexible portion sizes, pay-by-weight pricing system, smaller plates). • Revisit inventory management and procurement practices (as well as menus) to better fit needs based on historical trends and waste data. • Use scales in the kitchen to weigh food and track items most commonly wasted (and estimate the financial cost of food disposed, thus creating a financial signal to waste less).

Source: Flanagan et al., 2019

The private sector in Latin America and the Caribbean is pursuing some of these "to do" list items (Box 6).

BOX 6
Selected Private Sector Actions in Latin America and the Caribbean

The private sector can play a leading role in addressing the region's FLW. Examples are already emerging across multiple sectors and regions in Latin America and the Caribbean, from local start-up enterprises to multinational companies.

Manufacturers and producers. BRF, a Brazilian animal protein company that is one of the largest food companies in the world, has reported reductions in its FLW of 70 percent since 2018 through its Operational Excellence System. This initiative strengthens the link between agribusiness units and processing plants and has funded research to develop smart packaging that can extend product shelf-life (BRF 2020). Danone—which has set a global FLW reduction goal of 50 percent by 2025—is recovering its unsold, but still safe-to-consume products in Argentina and distributing them to local food banks and donates excess space in its refrigerated trucks to these same food banks (Ruiz, Moreno, and Suarez 2019). Nestlé is building a manufacturers' coalition in Latin America to streamline food product date labeling and educate consumers on how to interpret labels. The company is also supporting dairy producers in Brazil by improving management and production practices to reduce milk loss across their operations.

Grupo Bimbo, a multinational baked goods company based in Mexico, counts food waste among its six strategic action lines for environmental management and aims to halve food waste across its operations by 2025. The company launched a "War on Waste" (WOW) at manufacturing facilities and across its value chain to disseminate waste management best practices and processes, and it developed a real-time dashboard to automate data on food waste from sales and commercial outlets. Working with the Too Good To Go mobile phone application, the company now sells products close to their expiration date at a discount on Too Good To Go's secondary market. Early results from these various efforts have been promising—with operational food waste decreasing by 32 percent in Central America, 16 percent in Mexico, 7 percent in Canada and South America, and 5 percent in the Ricolino brand since 2019 (Grupo Bimbo 2021).

Food retail. Peruvian waste disposal company, Sinba, focuses first on reducing the amount of waste its clients produce and then on improving its own waste management systems to comply with local legislation (Berado et al. 2021). Sinba provides data and information on waste with full traceability, ensuring clients are aware of how much waste is being produced and where and how it is being discarded.

In Argentina, the company SiloPapa won a #SinDesperdicioHorticola (relating to horticultural waste) by developing an innovative solution to package tubers in bulk and reduce food loss in the Argentine horticultural chain. This packaging system was developed specifically for horticultural producers and can prevent 40 percent of post-harvest losses, which primarily occur when tubers are left underground for preservation purposes (Cañete et al. 2019). This solution allows for tubers to be stored for six months on-site and harvested at the right time, which also helps to reduce producers' transport costs.

In Mexico, SAVEFRUIT® won first place in a #SinDesperdicio contest for its innovative, non-toxic chemical treatment that extends the shelf life of produce. Treating fruit with its solution slows softening, preserves color, and protects against diseases to minimize FLW during storage, transport, and sale (IADB 2020). Mi Fruta, Mi Pueblo placed second in the contest for developing a community cooperative model that helps producers to transform seasonal fruits into innovative products. By partnering with Zapotec communities in Oaxaca, the company collectively identified new value-added products ideas for surplus citrus fruits, supported commercialization, and developed producer cooperatives in areas experiencing food shortages and poverty.

Hospitality. Hotels address the problem of food waste using a variety of tactics that suit their operational style and local infrastructure options. Velas Vallarta, an all-inclusive resort in Mexico, sends an average of 700 pounds of food waste per day to a local hog farm for animal feed (Velas Vallarta 2015). Belmond Copacabana Palace in Brazil recycles thousands of gallons of cooking oil and composts almost all other operational food waste as part of the food waste initiative it has led since 2008 (Ratliff 2018). Hotel La Compañía, a new Panamanian hotel, will center food waste as a core component of its operations, with a focus on replacing buffet style with à-la-carte dining, designing menus to maximize offerings of otherwise surplus food, and evaluating menu items for food waste reduction potential (Berado et al. 2021).

Concluding thoughts

FLW is a challenge that afflicts the Latin American and Caribbean region economically, socially, and environmentally. But low-cost, effective solutions do exist. Countries are demonstrating that large reductions are possible. Companies at various stages of the food supply chain are doing so, as well.

This Playbook is designed to help governments and businesses in the region embark on smart, bold, and practical efforts to tackle this challenge through the "Target-Measure-Act" approach. The #SinDesperdicio partnership can help governments and businesses on this journey (Box 7).

Action is needed now. The deadline for SDG Target 12.3 is less than a decade away. There is no more time, or food, to waste.

BOX 7
#SinDesperdicio

#SinDesperdicio is a platform of partners committed to reducing food loss and waste in Latin America and the Caribbean. Private sector partners include the Inter-American Development Bank, Dow Chemical Company, The Coca-Cola Company, Grupo Bimbo, Nestlé, Oxxo, United Nations Environment Programme (UNEP) and WRAP. Knowledge partners are IBM and Fundación FEMSA. Members of the advisory committee are the Food and Agriculture Organization of the United Nations (FAO), World Resources Institute (WRI), The Global FoodBanking Network (GFN), and The Consumers Goods Forum (CGF).

#SinDesperdicio works in four areas:

- **Innovation:** supporting the implementation of new technologies to reduce food loss and waste throughout the supply chain, from production to consumption.

- **Knowledge:** supporting countries in the development of studies and analyses to measure and identify the causes behind food loss and waste.

- **Public policy:** giving technical support to local and national governments in the development and implementation of legislation and public policies to create an enabling environment that tackles food loss and waste.

- **Behavior:** promoting responsible and sustainable behavior along the food supply chain.

To learn more, visit **https://sindesperdicio.org/es/** or contact Germán Sturzenegger at germanstu@iadb.org.

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[i] For more on the UK approach, see the Food Waste Reduction Roadmap, generated by WRAP.
[ii] The formula would be "percent reduction = ((year 1 tons of FLW / year 1 tons of food produced) – (year n tons of FLW / year n tons of food produced)) / (year 1 tons of FLW / year 1 tons of food produced) x 100"
[iii] These priorities are adapted from the FAO Voluntary Code of Conduct for Food Loss and Waste Reduction.

A playbook for reducing food loss and waste

in Latin America & The Caribbean

IDB