REDUCING FOOD LOSS & WASTE

A ROADMAP FOR PHILANTHROPY

FUNDED BY

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EXECUTIVE SUMMARY

More than one-third of all food produced worldwide is never eaten, and the consequences are profound.[1] Food loss and waste (FLW) deprives farmers of income, costs consumers money, exacerbates biodiversity loss, and causes at least 10% of greenhouse gas emissions. Meanwhile, 9% of the global population does not have enough to eat.[2] Food systems this wasteful are not only inefficient, they are harmful.

Just as the costs are enormous and far-reaching, so too are the benefits of reducing FLW. By working on this one issue, it is possible to improve food security and nutrition, strengthen economies, cut greenhouse gas emissions, and shrink our environmental footprint.

Reducing FLW is a powerful way to build food systems that nurture thriving societies and maintain balanced ecosystems. Sustainable Development Goal (SDG) 12.3 calls for a 50% reduction in per capita food waste by 2030 and reductions in food loss, and FLW is increasingly on the agenda in international climate negotiations. Most importantly, a group of leading nations is already proving that these ambitious commitments can be met. They are charting a path forward that others can follow – and that will pave the way to global gains.

The Netherlands, Japan, South Korea, and the United Kingdom (UK) have shown that it is possible to make meaningful, sustained reductions in FLW. For instance, the UK has decreased edible FLW by 27% between 2007 and 2018 thanks to policy change, strong leadership and coordination, public-private partnerships that have demonstrated economic value throughout the supply chain, and a popular 'Love Food Hate Waste' campaign (see case study on p. 7).[3] Multinational companies such as Tesco, Kellogg's, and Grupo Bimbo have achieved FLW reductions of over 30%.[4]

With known solutions and growing momentum, private philanthropy can play a catalytic role in accelerating progress. The Bezos Earth Fund, Betsy and Jesse Fink Family Foundation, the Robertson Foundation, and the IKEA Foundation funded leading subject-matter experts and strategists working at global, regional, and national levels to develop a roadmap for action (please see acknowledgements for a list of contributors). This roadmap is intended primarily to help philanthropic funders understand the topic and provide options for where their resources can have the greatest impact right now.

Progress will come first and foremost from work at the national and sub-national level. We have identified opportunities in six countries where work is already underway (China, Indonesia, Kenya, Mexico, South Africa, and the United States (US)) and in one (Brazil) where early efforts demonstrate opportunity worth highlighting. Philanthropic investment in this diverse group of countries will reduce absolute greenhouse gas emissions – together, they comprise about 30% of global FLW emissions.[5] It will also provide a more varied testing ground for what works, demonstrate the wide-ranging benefits of reducing FLW, and further incentivize both national and global action.

Since food systems operate across national borders, philanthropic support is also needed for organizations that support and coordinate work across geographies. These organizations enable progress in individual countries and drive it at the global level. Whether national or global, our funding recommendations for philanthropy focus on five pathways:

1 

SET POLICY TO DRIVE ACTION;

2 

REDUCE FOOD LOSS ON-FARM AND IN PRODUCTION;

3 

CHANGE HOW THE PRIVATE SECTOR OPERATES;

4 

CHANGE CONSUMER BEHAVIOR AND CULTURE; AND

5 

SUPPORT PEOPLE WHO CAN CAPTAIN AND COORDINATE THE WORK.

All together, this Roadmap outlines more than $300 million in philanthropic investments ready today to reduce FLW. By targeting philanthropic funding to these high-leverage interventions, it is possible to catalyze the changes needed by governments, the private sector, and individuals to put the globe on a path to permanent and significant reductions in the amount of food that is lost and wasted each year. We hope this roadmap convinces you to join us on the journey.

THE PROBLEM AND ITS CONSEQUENCES

FLW happens at every stage, from farm to fork

Between 30-40% of all food produced globally by weight is never eaten.[6] This is about evenly split between food loss (on farms or in the supply chain) and food waste (at the retail or consumer level).[7]

It has long been thought that on-farm food loss would be higher in less affluent regions with lower levels of on-farm mechanization, but recent research has shown that per capita farm loss is generally higher in Europe, North America, and industrialized Asia, with only 37% of the global population contributing 58% of global harvest loss.[8]

Figure 1 below provides examples of why FLW occurs and outlines sample solutions at different stages of the food system.[9] Preventing FLW delivers larger environmental benefits over those that recycle or recover nutrients from food waste (see Figure 2) because the resources dedicated to growing the food are not also wasted.

FIGURE 1: ABOUT FOOD LOSS & WASTE

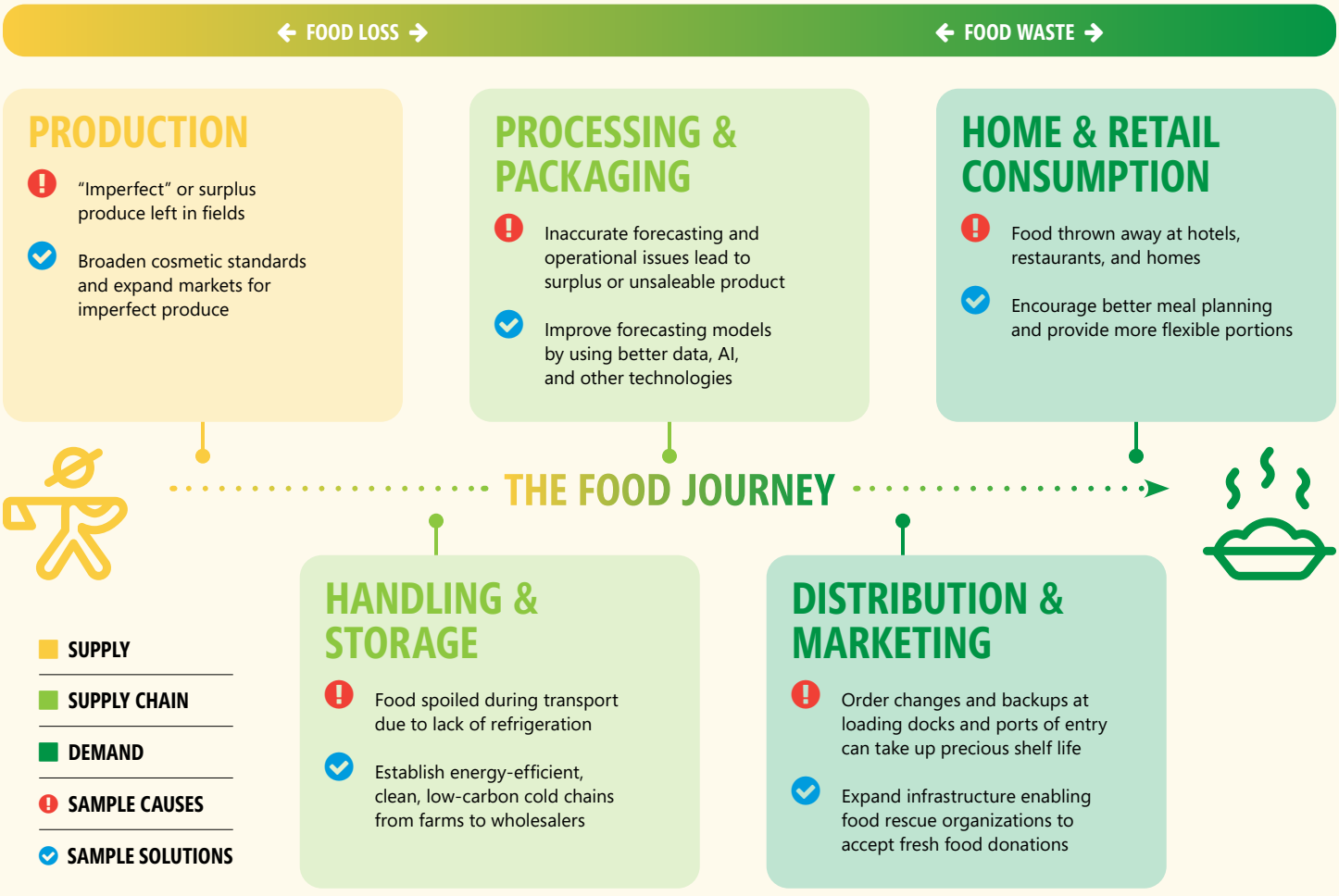
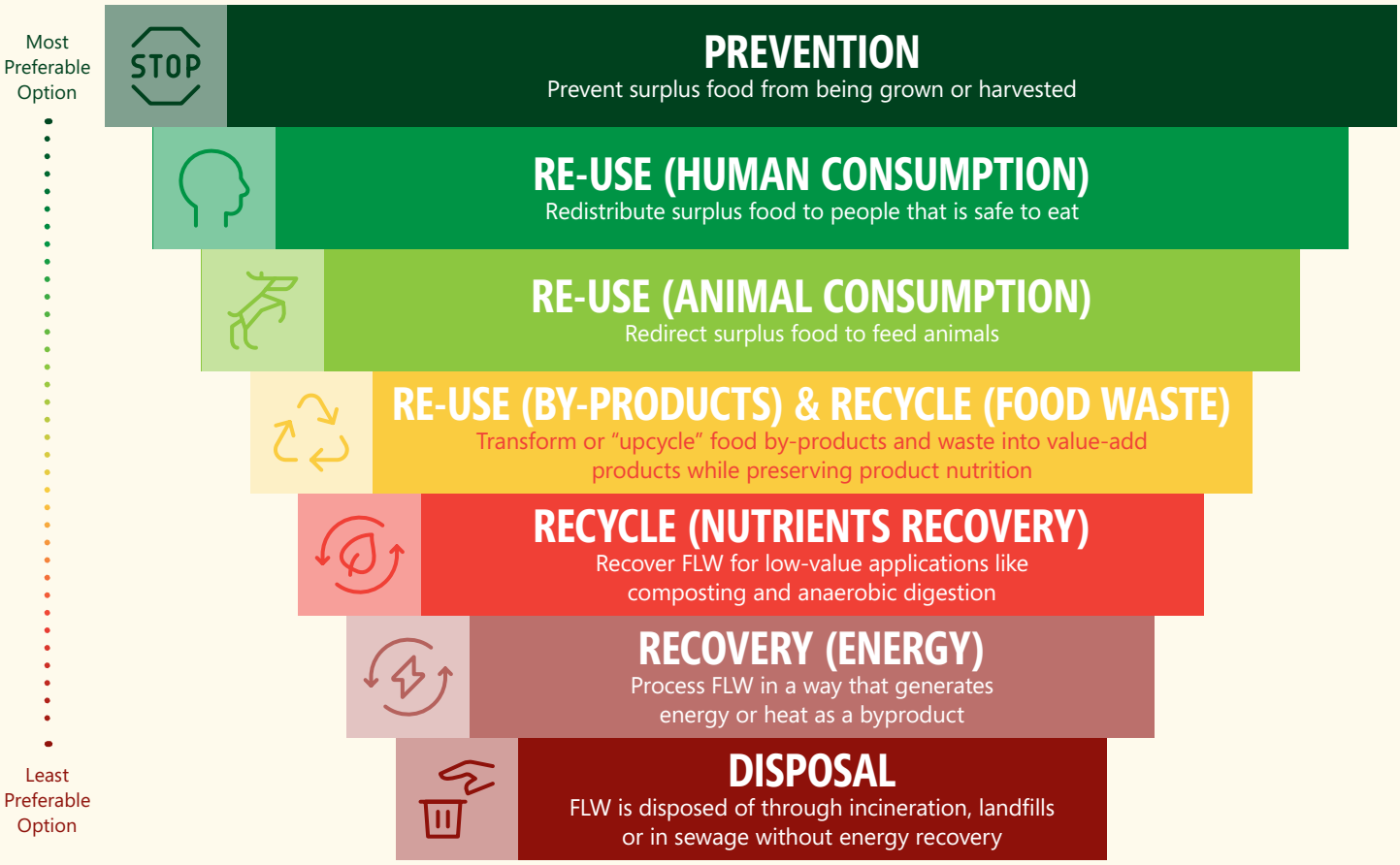


FIGURE 2: THE FOOD WASTE HIERARCHY

This example is adapted from the European Commission. Reuse, recycling and recovery definitions vary by geography.



FLW CONTRIBUTES TO THE CLIMATE CRISIS

Recent research focused on FLW's greenhouse gas emissions after the farm stage point to possible priority areas for climate interventions:[10]

- Meat and other animal products are responsible for 57% of these emissions. See ideas for how philanthropy can help reduce these emissions in the sidebar.
- Just five geographies are responsible for more than half of these emissions (56%): China, the European Union, India, the United States, and Brazil.[11]
- The entire supply chain causes greenhouse gas emissions, including 30% from consumers and retail establishments and 30% from poor waste management practices, including open dumps and landfills.

The regional differences in what people eat matter. For example, in the US, Europe, and Oceania, targeting FLW reduction measures on meat and other animal products is a top priority from a climate perspective since they are responsible for 60% of FLW emissions in these regions. Because cereals and pulses (e.g., the edible seeds of plants in the legume family) produce more greenhouse gas emissions as they decompose, they are an important source of waste emissions in all regions and especially in Sub-Saharan Africa and Asia.

WHERE TO START IN TACKLING FLW EMISSIONS FROM MEAT, DAIRY, AND OTHER ANIMAL PRODUCTS:

- Look for opportunities to change food environments to preference low-waste and plant-based diets together, as **Red de Bancos de Alimentos de México**'s consumer campaign in Mexico does.
- Look for opportunities to identify the cause of this waste, as the **Pacific Coast Food Waste Commitment**'s Dairy Working Group is doing.
- Support work to clarify date labels, which can significantly reduce unnecessary dairy waste. See the **Global Food Donation Policy Atlas** for more information.
- Prioritize reductions from meat and other animal products in all supply chain related work with the private sector.
- Support third party modeling of animal-related production losses since current models draw on only produce-related data.

THE BENEFITS OF TAKING ACTION NOW

Reducing FLW has multiple benefits for people, economies, and the environment

- **CLIMATE CHANGE:** The United Nations has said that FLW represents 8-10% of global greenhouse gas emissions[12], and recent studies suggest that this figure may be closer to 12-13%.[13] Because methane is a more powerful climate pollutant in the short-run, reducing FLW now, alongside reducing carbon dioxide emissions, is imperative to keep warming below 1.5°C and avoid some of the worst climate impacts. Further, reducing FLW is a climate change solution that can meet people where they are – at their kitchen table, local restaurant, or grocery store. See the box on page 5 for more on the connection between FLW and climate change.
- **HUNGER AND NUTRITION:** The world discards well over one 1 billion tons of food each year,[14] while 9% of people globally are food insecure.[15] The most nutritious foods, such as fruit and vegetables, are more often discarded because they are perishable. Improving food safety, preservation, and distribution through local processing infrastructure and cold chain technologies, for example, can ensure nutritious food reaches people. Food recovery organizations play an important role in rescuing surplus food and increasing food access and dietary diversity while reducing FLW.[16] In 2020, they provided food to 66 million people around the world.
- **AGRICULTURAL DEVELOPMENT:** Smallholder farmers produce one-third of the world's food.[17] For them, food that is not sold is income lost. Reducing on-farm food loss can increase incomes by up to 15% for 470 million smallholder farmers and 290 million people whose livelihoods rely on agriculture in developing countries, most of whom are food insecure.[18] Improving farmers' access to markets through better information and improved cold chain capacity, for example, can also increase incomes.
- **ECONOMIC EFFICIENCY:** The annual global cost of FLW is close to $1 trillion.[19] In Mexico, for example, the country's gross domestic product (GDP) could increase by 2.5% if food wasn't lost or wasted.[20] That translates to additional income for businesses and money saved for consumers. By 2030, a 20-50% reduction in global food waste could save consumers an estimated $120-300 billion per year.[21] That is $1,300 (USD) per household in Canada and $1,600 (USD) in Australia.
- **ENVIRONMENT:** The food system puts pressure on 86% of the world's threatened species, yet land area the size of China is used to grow food that is lost or wasted.[22] The impacts are not limited to land: when fishers cannot depend on cold storage when they return with their catch, they fish more in anticipation of the loss. One quarter of water and fertilizers used for agriculture are for food that is not eaten.[23] Reducing the current rate of FLW by 50% by 2030 can significantly reduce our impact on the environment, ultimately saving natural ecosystems the size of Argentina.[24]

The world's population is expected to grow from 8 to 10 billion by 2050. As the population grows, so too will the demand for food.[25] Without a reduction in the rate of FLW, the amount of FLW is projected to double as the food system expands to meet this demand.[26] Improving our food system so that more of the food produced is used and eaten will deliver near term benefits and put us on the path to a sustainable food system capable of feeding everyone. It will also help stabilize the climate and protect the natural resources on which we all depend.

IMPROVING OUTCOMES FOR SMALLHOLDER FARMERS[27]

The Rockefeller Foundation's Yieldwise program focused on training and improving the supply chain for maize, mango, cassava, and tomato through the utilization of loss-reducing technologies in Sub-Saharan Africa. In four years' time, it resulted in a 20-30% reduction in post-harvest loss as well as increased incomes and improved food security.

THE UNITED KINGDOM'S FOOD WASTE REDUCTION SUCCESS:

A Coordinated, Collaborative Effort Across Government, Civil Society, Business, and the Citizenry[28]

While a number of countries around the world have made progress in reducing food loss and waste, the United Kingdom (UK) is widely recognized as a leading example. Between 2007 and 2018, the UK successfully decreased edible food waste by 27% and household food waste by 31%. While still working to meet Sustainable Development Goal (SDG) 12.3's goal of 50% reductions in food waste by 2030, the UK's work to date is one example for other countries seeking to achieve similar reductions. The key to success in the UK was a collaborative effort across multiple sectors that was spearheaded by an organization capable of coordinating the work and resourced to do so. Some of the elements of this work that may be relevant to other geographies are described below. The return on investment for this effort was 1:7 in benefits to society.

EFFECTIVE GOVERNMENT POLICIES played a pivotal role in driving the UK's success. A landfill tax that increased annually starting in 2011 put pressure on businesses and others to find ways to reduce what they sent to landfills. Also significant was legislation standardizing and clarifying "sell by" and other food date labels, improving consumer understanding of when food could be consumed rather than thrown away.

STRONG STRATEGIC DIRECTION AND COORDINATION was a key factor driving success. The Waste and Resources Action Programme (WRAP), created thanks to significant government funding, developed measurement, research, analysis, and policy expertise that was essential to advancing a multi-pronged strategy. WRAP facilitated the engagement of businesses and worked to change consumer behavior through public campaigns, thereby fostering a holistic approach to waste reduction.

EXPANSIVE PUBLIC-PRIVATE PARTNERSHIPS fueled change at many levels. WRAP spearheaded a series of voluntary agreements aimed at helping businesses understand and implement changes to reduce FLW in their supply chains. Collectively called the Courtauld Commitment, WRAP engaged different actors across the food supply chain, from farm to fork, ultimately involving over 80% of the retail market and creating new norms for business. With a growing body of data, WRAP could show the economic benefits that FLW reductions brought at every stage of the supply chain. Retailers and suppliers engaged in pre-competitive actions to address drivers of waste in the supply chain, such as challenging aesthetic standards. Moreover, signatories to the Commitment implemented changes in their retail environments, such as changing packaging sizes. As a result, consumers were better equipped to reduce waste at the household level. This alignment bolstered the Commitment's effectiveness and provided critical evidence to support food waste policy change.

CONSUMER BEHAVIOR CHANGE CAMPAIGNS were also essential. The "Love Food Hate Waste" campaign became a cornerstone of citizen behavior change in the UK. Its strong, consistent brand was amplified by retailers, manufacturers, businesses, and local authorities. The campaign started with broad awareness raising about cost savings, a top consumer concern at that time. Market segmentation analysis helped inform consistent but tailored messaging, which was further amplified by Courtauld Commitment signatories, extending its reach at low cost. This consistent messaging across retail and civil environments was key to its effectiveness. Feedback, an outspoken citizen advocacy organization on plastics reduction and food waste, also provided valuable pressure for action from outside the business and government sectors.

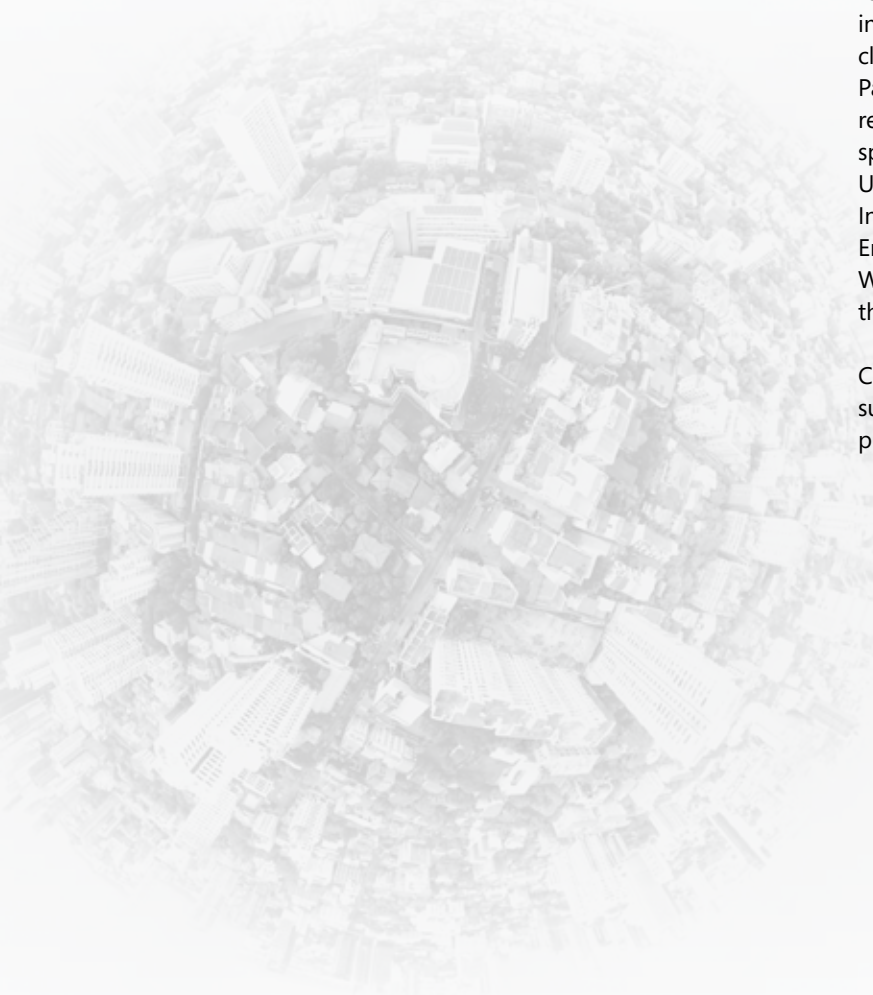
PROGRESS IS ACCELERATING

Recent success is attracting increasing attention from the private sector and policymakers

We have seen that it is possible to make meaningful, sustained reductions in FLW. For example: the Netherlands reduced its food waste by 23%;[29] South Korea has achieved a 95% reduction in consumer food waste;[30] Japan reduced its FLW 12%;[31] and the United Kingdom has decreased edible FLW by 27% since 2007 (see the case study on page 7 for more detail).

A number of other countries have made reducing FLW a top priority, including:

- China, where there is an Anti-Food Waste Law which requires all sectors to set food waste reduction targets, measure their waste, implement reduction efforts, and disclose progress;
- Australia, which has a national food waste strategy and commissioned a feasibility study showing it is possible to reduce FLW by 50%;[32] and
- South Africa, which is currently developing a national FLW reduction plan.



A WINNING ISSUE IN THE PRIVATE SECTOR

Action on FLW is growing in the private sector, partly to increase profits and partly for environmental benefits. Eighty percent of the world's 50 largest food companies have agreed to reduce their FLW by 50% by 2030.[33] Of the 40% of companies that report their data, many have reached 30% in reductions.[34] A number of multinational companies have achieved reductions over 30%, including Tesco, Kellogg's, and Grupo Bimbo.[35] Reducing FLW can contribute to creating a circular economy and is a business opportunity for small and medium enterprises and bigger companies. For example, Apeel is a company that uses plant-derived technology to keep produce fresh from farm to table by adding a microscopic layer of what already naturally exists on fruits and vegetables. Starting with a $100,000 grant from the Bill & Melinda Gates Foundation in 2012, the company has saved 70 million pieces of produce from going to waste and is the first "food waste unicorn," reaching a valuation of $2 billion.[36]

A GROWING GLOBAL PRIORITY

FLW is also rising on the global agenda. The Sustainable Development Goals (SDGs), which are agreed to by almost every country, include a target on reducing FLW. SDG 12.3 calls for a reduction of 50% in food waste by 2030, as well as a reduction in food loss along production and supply chains. Because of its climate impacts, reducing FLW is also critical to delivering on the Paris Agreement and the Global Methane Pledge. Governments representing roughly 55% of the global population have set specific targets in line with SDG 12.3, including the African Union, Argentina, Australia, China, the European Union, Indonesia, Japan, Malaysia, South Africa, the United Arab Emirates, the United Kingdom, the United States, and Vietnam.[37] With only seven years to go before 2030, it is time to build on this momentum.

Catalytic funding from philanthropy can turn this opening into sustained action by supporting leading experts, advocates, and practitioners.

STRATEGIES AND SOLUTIONS ARE CLEAR

Philanthropy has an essential role to play and opportunities are ripe for investment

REDUCING FLW TAKES MULTIPLE ACTORS

FLW occurs throughout our food systems. Successfully reducing it requires an understanding of how different components interact within and between food systems. Looking across leading efforts to reduce FLW to date, there are three lessons learned for working effectively in this complexity.

1. **STRATEGIC COORDINATION LEADS TO SUCCESS.** Because targeting one "stage" between food production and consumption can simply displace the waste somewhere else, coordination is key. For instance, major UK retailer Sainsbury's and potato processor Lamb Weston worked together to analyze potato waste across the supply chain. As a result, they agreed that Sainsbury's would accept products with shorter shelf life, leading to 8,000kg of potatoes saved in just the initial period of the project.[38]
2. **ANY SECTOR CAN LEAD THE CHARGE – AND MULTIPLE SECTORS WORKING TOGETHER ARE MOST EFFECTIVE.** The UK case study shows what is possible when multiple sectors – government, private enterprise, and civil society – come together. Government buy-in and capacity is critical for sustained progress. However, action need not await government commitment. For example, the private sector and NGOs took up the mantle of reducing FLW in Australia, prompting the federal government to release a National Food Waste Strategy in 2017 to halve food waste by 2030.
3. **INTEGRATING FLW INTO EXISTING WORK CAN ACCELERATE SCALING.** Because reducing FLW requires multiple actors across multiple sectors, integrating FLW into the work of existing organizations and communities can quickly scale action. For example, the Posner Foundation funds Monte Azul, an organization striving to build local, resilient food systems in Puerto Rico, where 80% of food is imported.[39] While the organization's primary goal is to increase food security by reducing costs and preparing for hurricanes, it has the added benefit of reducing FLW because less food spoils en route to the island.

PHILANTHROPIC LEADERSHIP IS ESSENTIAL

With the ability to deploy capital flexibly, philanthropy is uniquely positioned to invest in thought leadership and convene multiple stakeholders to catalyze the change that is needed from farm to fork. Current funders include the Bill & Melinda Gates Foundation, the IKEA Foundation, the Posner Foundation, and the Robertson Foundation. ClimateWorks Foundation research shows that only $18 million of climate mitigation philanthropy was invested in reducing FLW globally in the five years between 2017 and 2021 – an amount that is not commensurate with the climate implications of the problem.[40, 41] This issue is ripe for more funding, and this Roadmap outlines more than $300 million in philanthropic investments ready today to reduce FLW in a set of priority countries and across geographies.

Looking across the pioneering work that has happened to date, we have identified five ways philanthropy can spur reductions in FLW, which vary depending on the country and context (see Figure 3). In each of these five pathways, philanthropy provides the catalytic capital that will spur shifts in government policy and funding, influence private sector incentives, and promote norms that will lead to lasting change.

In each pathway, we have highlighted specific opportunities for philanthropic funding based on the suggestions and recommendations of partners operating at national and global levels. These recommendations are not comprehensive of all important FLW efforts happening globally. We have prioritized solutions that target loss and waste further upstream because such interventions have greater environmental impact.

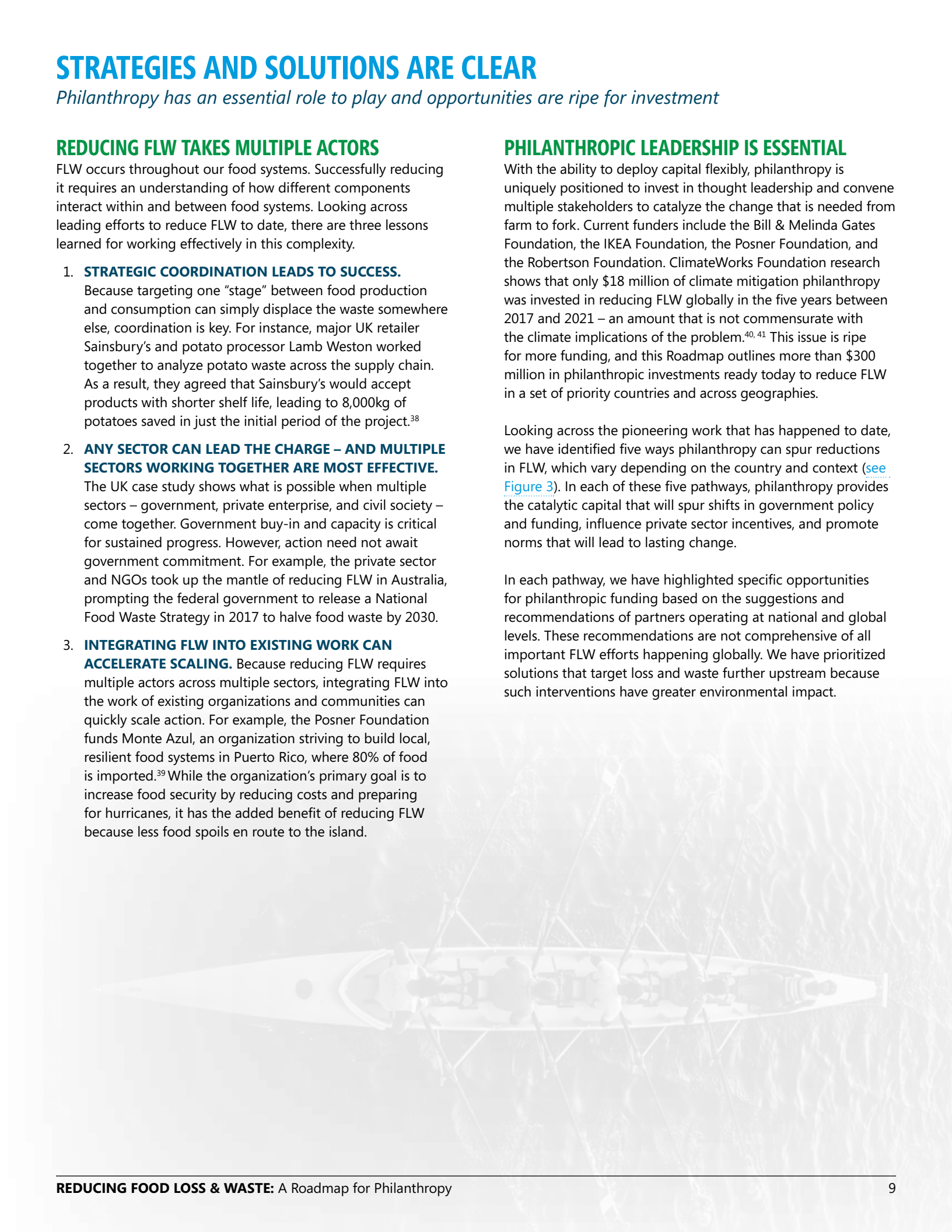


FIGURE 3:
FIVE WAYS PHILANTHROPY CAN SEED REDUCTIONS IN FLW

1

SET POLICY TO DRIVE ACTION: Policymakers and policy implementers have an important role to play in regulating markets to disincentivize waste and incentivize efficiency and a circular economy. This includes establishing a FLW reduction strategy and program, measurement standards, protocols, and capacity, as well as providing training services and infrastructure and investing in innovation. Public procurement policy also shapes a significant segment of food purchases through the military, hospitals, and schools. Key policies that shape FLW rates include bans on organic material in landfills, government funding for research and development, support for cold chain infrastructure, guidance on food safety and donation, and public funding for consumer education and behavior change.

Because policy is critical to shaping behavior and incentives, educating the public, policymakers, and policy implementers about FLW policy is an integral aspect of most of the funding opportunities in this roadmap, both in the national roadmaps and in the supporting international recommendations. For example, in **South Africa**, a national FLW reduction plan is out for comment and multiple organizations are pushing for ambitious government goals and action. In the **United States**, the **Zero Food Waste Coalition** seeks to increase the number of states which restrict food waste from landfills from the nine which do now to 14, covering one-third of the US population.

At the global level, organizations from the Global North and South are starting to come together in the **Food Loss and Waste Alliance** to spearhead global efforts to reduce FLW. One of their priorities is to keep FLW on the public agenda and provide support to policy work in countries. The Alliance includes many of the leading global FLW organizations such as the **Food and Land Use Coalition (FOLU)**, **The Global FoodBanking Network**, **ReFED**, **Waste & Resources Action Programme (WRAP)**, **World Resources Institute (WRI)**, and **World Wildlife Fund (WWF)**, who all have policy expertise and are present in multiple countries (See Appendix D). The **Global Food Donation Policy Atlas**, an initiative by the Harvard Law School Food Law and Policy Clinic (FLPC) and the Global FoodBanking Network (GFN), supports in-country policymakers

and other stakeholders in countries around the world to advance national laws and policies to deter food waste and make food donations easier and safer. The **Global Methane Hub** is working to mobilize more public financing and technical resources for reducing FLW in developing countries. Cities are an important locus of action because 70% of the worlds' food is consumed in them and mayors are usually directly in charge of waste collection and treatment. **C40**, one of a number of city-based networks, works with over 60 cities on food systems and waste policy, among other issues. Intergovernmental organizations like Food and Agriculture Organization of the United Nations (FAO) and the United Nations Environment Programme (UNEP) also play important roles in providing technical assistance to governments to measure and report on FLW and adapt their national policies.

REDUCE FOOD LOSS ON-FARM AND IN PRODUCTION: Food is left in fields if it does not meet consumer expectations of appearance, there are changes in supply or demand, or lack of connections to markets make it unprofitable to harvest. Disease, poor harvesting techniques, and inadequate on-farm transport and storage (including cold storage) all contribute to food loss as well. Per capita farm loss is generally higher in geographies with industrialized food systems, but less industrialized food systems are also important because smallholder farmers produce one-third of the world's food and are often food insecure themselves. Priority solutions for smallholder farmers in developing countries include changes in on-farm practices (e.g., improved storage and harvesting techniques) as well as better information about and improved access to markets. The ability to keep food cold is an important part of holistic supply chain development and relates to other climate topics (e.g., energy and coolants). Top investable opportunities in this pathway include:

- **10x20kx30**, a new project at WRI, is partnering with **10** global and regional farm-facing agriculture companies to each engage **20,000** of their large supplying farmers to cut on-farm and near-farm food losses in half by 20**30**. The project provides farmers with training and access to finance, technology, and markets to help reduce food loss during harvest and post-harvest.
- Connecting farmers to buyers is core to the work of **Good Food Innovation Fund** and **Village Capital**, which are incubating and funding businesses that create new and expand existing markets to buy what farmers and fishers produce. The **Post-Harvest Network for Indonesian Nutrition (JP2GI)** in **Indonesia** works to match buyers with fishers and supports efforts to develop new ways to preserve and market fish. Food banks in **Mexico**, **South Africa**, and elsewhere are seeking to obtain unsold produce at farm level to feed communities locally, nationally, and internationally.
- Building out private sector businesses to provide needed access to storage and transportation is a focus in **Kenya**, where recommended projects at the **University of Nairobi** and **SokoFresh** are developing sustainable cold storage technology and building a cold chain network to reduce post-harvest and post-catch losses.
- Another project that stands out because of its success in reducing FLW and turning it into improved nutritional outcomes for school children in multiple countries is the **Fortified Whole Grain Alliance (FWGA)**. FWGA focuses on increasing consumption of whole grains, because refining flour loses 30% of the most nutritious part of the grain. In addition to combatting this leading cause of health risks, a full switch to whole grains would reduce cropland use, greenhouse gas emissions, and fertilizer use.
- Organizations that educate farmers on how to avoid pest damage, better store produce, and connect farmers to markets are a critical part of the solution. Many such organizations exist, including One Acre Fund, Digital Green, Technoserve, CARE, and Sawbo Animations.

  Reducing food loss on farms and in production requires a combination of tools, including working with farmers and companies, changing policy, providing public funding, and using philanthropic capital to spark innovation, attract private capital, and create markets that will enable change over the longer term. Work with farmers and other producers tightly links to work with private sector actors in the food supply chain, who bring the food from farm to fork, which we turn to next.

CHANGE HOW THE PRIVATE SECTOR OPERATES: People who work in businesses that process, package, distribute, market, and sell food are key to reducing FLW. A first step for any business is understanding where FLW is occurring and then changing everyday business practices and incentives. Another WRI project, **10x20x30**, aims to do this by working with **10** of the largest food companies to each engage **20** of their priority suppliers to halve their food waste by 20**30**. Already, more than 200 suppliers are participating and leading companies are seeing significant reductions – of up to 54% – in their FLW. The role of private finance in influencing company behavior and the food system is also important and a focus of **Planet Tracker**, which works directly with different entities in the financial system and acts as a financially literate watchdog of company behavior.

Engaging private sector actors to reduce FLW has been central to national-level efforts. Public-private partnerships (PPPs) attract actors at every stage of the food supply chain. By spurring measurement of FLW and developing solutions that save money, PPPs can help ensure that waste reduction at one link in the chain does not simply push the waste up or downstream. In these PPPs, companies collaborate to

share what works and what does not, which in turn informs standards and policy. In many cases, private sector actors become advocates for better policy and engage in efforts to shift consumer behavior. PPPs are part of strategies in the **US**, **Mexico**, **South Africa**, **China**, and **Indonesia**.

Innovation and entrepreneurship play a key role here, as the Apeel example above demonstrates. Philanthropy can use a range of types of capital – from grants and mission- and program-related investments to blended capital – to help fledgling businesses gain early-stage access to local and global capital, thereby setting them up for long-term success. In addition to the **Village Capital** and **Good Food Innovation Fund** incubators noted above, ReFED is interested in combining its issue expertise about loss and waste in supply chains with experience in the investment sector to develop the **ReFED Investment Platform**. The Platform would deploy below-market-rate-equity, debt, and grant capital in a coordinated fashion to support development, testing, adopting, and scaling of FLW solutions. **WWF** also supports investors to identify such opportunities.

4

CHANGE CONSUMER BEHAVIOR AND CULTURE: Changing individual and household behavior is another important step in reducing food waste. Consumer behavior campaigns were integral to success in the Netherlands, South Korea, and the UK. These efforts raised awareness about the economic, environmental, and health impacts of over-purchasing and food waste. Campaigns blend interventions at points of purchase (e.g., groceries, restaurants, and cafeterias), as well as in schools, universities, and in the media. They offer not just messages, but strategies proven to reduce waste, such as meal planning, smaller portion sizes (at home and in restaurants), and shifting to a more plant-based diet. Consumer-facing campaigns are highlighted in the **US**, **China**, **South Africa**, **Mexico**, and **Indonesia** national roadmaps. For example, in the US, the **Pacific Coast Food Waste Commitment (PCFWC)** is looking to collaborate with researchers on reducing portion sizes in restaurants, where 70% of the waste comes from diners' plates. In Mexico, multiple consumer behavior campaigns are in the testing phase, aiming to shift behaviors related to waste and diet choice (towards plant-based foods). In Indonesia, a campaign, **Consumindful**, just concluded its pilot phase and will be ready to expand in 2024. **WRAP**, **FOLU**, and **WWF** bring deep experience with consumer-facing work across geographies.

5

SUPPORT PEOPLE WHO CAN CAPTAIN AND COORDINATE THE WORK: Solving FLW issues requires a systems-level analysis and strategic intervention. This means that having a group (or coordinated alliance) focused at the systems-level is an invaluable feature for long-term success. Here, "captaining" involves mapping the landscape, identifying priorities for intervention across types of capital, and tracking progress. It also includes gathering and sharing lessons learned, connecting people, identifying useful tools and expertise, and communicating at local, national, and global levels about the issue. At the international level, we recommend start-up support to create this captaining function – initially named the **Food Loss and Waste Alliance**. It would bring together key global and national actors to chart a path for ongoing efforts. At the national level, we recommend **ReFED** as the hub in the U.S and **Pacto por la Comida**, a project of **Red BAMX** supported by **WRAP**, in **Mexico**.

PRIORITY COUNTRIES

Action is best developed and advanced at both national and local levels, with support, learning, and coordination happening across geographies.

Achieving the 50% reduction target named in SDG 12.3 ultimately requires action and resources from national governments and the private sector. Each country will take its own path because the causes of and solutions to FLW are shaped by climate, culture, economics, and politics, among other factors.

The UK, Japan, the Netherlands, and South Korea have all made notable progress, and their approaches provide important models for others to adapt and adopt in their contexts. This Roadmap identifies a number of countries for immediate action in the global effort to reduce FLW: Brazil, China, Indonesia, Kenya, Mexico, South Africa, and the US. These countries were chosen based on a number of factors:

- work on FLW was already underway;
- potential for regional or global influence;
- ability to learn about different strategies and approaches for reducing FLW (e.g., farming, fishing) that can inform work elsewhere;
- potential greenhouse gas emissions reductions;
- diversity of geographies, economic structures, and levels of government engagement.

Together, these seven countries represent over 30% of the global population and a similar level of global FLW-related emissions. Their collective diversity of geographies, types of political and economic structures, and sources and solutions for FLW will enable a step-change in learning on what works to reduce FLW that can then inform further action.

As we did in each pathway, we have highlighted specific opportunities for philanthropic funding in each country (with the exception of Brazil, see description) based upon the suggestions and recommendations of partners operating at national and global levels. These recommendations are not comprehensive of important FLW efforts happening in any country, nor are these countries comprehensive of where action on FLW should be accelerating. We have prioritized solutions that target loss and waste further upstream because such interventions have greater environmental impact.

BRAZIL

Brazil's growing efforts to address FLW are nascent, and progress in this country could deliver enormous impact both at home and abroad. Brazil is one of the 10 largest countries in the world by population. Its agricultural sector is massive, and it is one of the primary drivers of deforestation of the Amazon, due to cattle ranching and growing livestock feed. The recent re-election of President Luiz Inácio Lula da Silva combines opportunity and urgency. President Lula has made both slowing the rate of deforestation and reducing hunger priorities. Brazil is hosting the G20 in 2024 and the climate negotiations in 2025, putting international attention on its progress. Local and national level efforts are ramping up (including a national food bank working in all 26 states), but increased resources, stronger coordination, and strategic alignment would help national actors meet the opportunity. International groups are active in Brazil and eager to support local actors. This includes WRAP, WWF, WRI, UNEP, FAO, and the Global FoodBanking Network. Please see the **Brazil National Roadmap** for more information.

CHINA

China presents an unparalleled opportunity for progress and impact when it comes to reducing FLW. The second largest country by population, China is the world's top agricultural producer.[42] Approximately 300 million tons of food are lost each year in China during processing and storage stages, equivalent to a loss rate of 30%. At the consumer end of the system, 160 million tons of food are wasted in the home, restaurants, or other dining areas – a waste rate of 22%.[43] Overall, China's scale of FLW is so great that reducing it by 50% would not only reduce 320 million metric tons of greenhouse gas emissions annually, but could also meet the food and nutrition demands of 400 million people, save 300 million cubic meters of water, reduce demand for 40 million hectares of agricultural land, and significantly decrease fertilizer pollution.[44] Recent policy commitments at the national level are inspiring efforts at nearly every step where FLW is occurring. NGOs, trade associations, provincial governments, Chinese foundations, and think tanks are all collaborating on implementing solutions. We have identified opportunities totaling $12.75 million supporting this wide range of actors operating across China, including Shenzhen One Planet Foundation, WWF-China, and WRI-China. Please see the **China National Roadmap** for more information.

INDONESIA

With the world's fourth largest population and seventh largest economy, Indonesia's efforts to reduce FLW are important at national, regional, and global levels. The country's development planning agency estimates FLW causes 7% of the country's greenhouse gas emissions and results in economic losses of $13-15 billion per year, or 4-5% of GDP. At the same time, 8% of the population faces food insecurity—a situation that could be solved through improved food recovery and redistribution. With one of the world's most extensive rain forests, minimizing FLW can reduce the pressure to deforest. Indonesia's vast fisheries sector offers an opportunity to test and scale solutions that can be adapted in other countries dependent upon fish as a major source of food. The government is actively working on FLW, collaborating with NGOs, the private sector, and communities to develop and scale solutions. Two years ago, with financial and technical support from WRAP, the Indonesian Business Council for Sustainable Development (IBCSD) launched Gotong Royong Atasi Susut & Limbah Pangan di Tahun 2030 (GRASP2030): a public-private partnership addressing FLW across the supply chain. Initial work raised awareness about the issue and moved it up in the national agenda. It is now working on projects to reduce loss on farms and waste in hotel chains. Another effort engages Indonesia's vast fishing sector to reduce losses by around 30%, improving nutrition across the country as a result. A consumer behavior campaign, Consumindful, is coming to the end of its pilot phase and will be ready to expand in 2024. We have identified opportunities totaling $10-$20 million for work by the IBCSD, Post-Harvest Network for Indonesian Nutrition (JP2GI) (reducing fishery loss), and the Consumindful campaign. Please see the **Indonesia National Roadmap** for more information.

KENYA

Kenya presents a compelling case for work to reduce FLW. Agriculture and related sectors contribute over 50% of GDP and 65% of export revenues, providing useful lessons for countries with similar economic profiles in the region and beyond. Food loss rates in the country are over 30%, and more than a third of all Kenyans face food insecurity. If left unaddressed, these problems are projected to worsen over time, impacting the country's people, economy, and environment. Exciting efforts are underway in rural, coastal, and urban settings to scale tested solutions to improve rural livelihoods, nutrition, and climate. The Kenyan government has committed to addressing FLW, with implementation in early stages. One needed step involves helping the government establish a measurement protocol and practice that can identify hot spots and monitor progress. Reducing farm-level/fishery-level and post-harvest/catch losses can come from scaling-tested approaches that address short-and long-term storage and transportation issues. Recommended projects in Kenya include efforts to build out a cold chain network to reduce post-harvest and post-catch losses, improve grain preservation, and other technologies that help keep food fresh and edible until it can be purchased and eaten. Approaches to expanding access to these various technological capacities include social enterprise support and development, policy advocacy, and infrastructure funding. WWF-Kenya is also recommended for its work at the retail and consumer end of the food system, including efforts to expand circular food economy projects that can turn waste into needed fertilizers. In total, we have identified philanthropic funding opportunities of more than $15 million over three years for work by FOLU, Kenyan Agricultural Value Chain Enterprises (KAVES), SokoFresh, WWF-Kenya, and others. Please see the **Kenya National Roadmap** for more information.

MEXICO

Given its population, high per capita FLW, role as a significant global food supplier, and influence within the Latin America and Caribbean region, Mexico is a top priority country for action on FLW. By reducing FLW, Mexico can address a number of acute problems including food security and nutrition, rural poverty, water scarcity, and greenhouse gas emissions. Action is already underway, with Iniciativa Climática de México prepared to seize the opportunity to shape debates and future policy on FLW in national elections in 2024. A coalition of food related businesses, NGOs, and trade associations has launched Pacto por la Comida, a national voluntary agreement to reduce food waste by 50% by 2030. The early stages of that work involve establishing measurement and reporting protocols, then identifying where loss and waste can be reduced along the supply chain. Red de Bancos de Alimentos de México (Red BAMX) – already active in 29 of Mexico's 33 states – is scaling network operations to recover food (primarily fresh fruits and vegetables from farms and food markets) and redistribute it. Multiple consumer behavior campaigns are testing messaging. The second phase of these campaigns will pilot efforts to shift behaviors related to waste and diet choice (towards plant-based foods). We have identified $21 million in funding opportunities over three years to support Iniciativa Climática de México, Red BAMX, and the Pacto por la Comida initiative. Please see the **Mexico National Roadmap** for more information.

SOUTH AFRICA

South Africa is poised to be a world leader on reducing FLW. A government study estimates that 45% of food is lost or wasted annually in South Africa, while 60% of households are food insecure. The South African government's engagement on FLW offers an opportunity to establish what promises to be amongst the most comprehensive and ambitious national efforts outside of Europe. While a national strategy is out for public comment, various agencies are already collaborating with stakeholders across the food supply chain to identify needed policy reforms, update regulations, recognize opportunities to increase surplus food rescue and redistribution, and reduce waste going into landfills. The South Africa Food Loss & Waste Initiative, a public-private partnership, is now in its third year and participating food system businesses are discovering reductions in their waste through improved ordering, use of composting, and other interventions. Funding to that effort can help it expand engagement of participating businesses and create additional

working groups focused on providing solutions (and savings) to known sources of FLW. South Africa's well-established food banks seek funding to double their capacity over seven years and WWF-South Africa requires support to amplify voices pushing for ambitious government goals and action. We have identified $16.8 million in funding over three years to support the Consumer Goods Council of South Africa, WWF-South Africa, and FoodForwardSA. Please see the **South Africa National Roadmap** for more information.

UNITED STATES

The United States offers enormous opportunities for major reductions in FLW. The world's third most populous country, its FLW is near the top of the worldwide range at about 40%. Food waste is the largest source of organic waste inputs to US landfills, which increasingly face space and cost constraints. Efforts in the US are already underway and showing impact, thanks in part to a well-coordinated NGO sector that is identifying opportunities and tracking results. There has been slow but steady progress in reducing landfill methane emissions. Nine states, representing 25% of the US population, have adopted laws to keep food waste out of landfills, and a growing number of cities require organics be diverted from household trash. Next steps include work to pass landfill disposal bans of organics in more states, thereby incentivizing reduction of FLW upstream. Having proven successful on the west coast, the Pacific Coast Food Waste Commitment (PCFWC), a public-private partnership to reduce FLW, is preparing to go national, leveraging the country's highly-concentrated food retail sector to address inefficiencies at every link of the supply chain. In addition, work is needed to reduce waste in the hospitality sector, driven by outsized portions. We have identified $50 million in funding over three years to support ReFED, PCFWC, the Zero Food Waste Coalition, and the Natural Resources Defense Council (NRDC), and others. Please see the **United States National Roadmap** for more information.

CONCLUSION

Reducing FLW delivers far-reaching benefits. It mitigates climate change, reduces poverty, increases food security, improves economic outcomes, protects the environment, and more. Progress has been made in recent years, including successful initiatives in multiple countries and within the private sector, and there is a growing recognition of the need for global action, with SDG 12.3 and climate negotiations highlighting FLW's significance. Philanthropic leadership now could rapidly scale successful work underway, both in key countries and globally, leading to significant, meaningful FLW reductions.

INVESTABLE OPPORTUNITIES BY TOPIC

Below we have grouped projects that, in addition to reducing greenhouse gas emissions and building a circular economy, address another issue of concern or use a particular approach to reduce FLW. You can read more about these projects in Appendix A.

NUTRITION & FOOD SECURITY

- Fortified Whole Grain Alliance
- Good Food Innovation Fund
- Global FoodBanking Network
- Global Food Donation Policy Atlas
- Post-Harvest Network for Indonesian Nutrition (Indonesia)
- Red de Bancos de Alimentos de México (Mexico)
- FoodForward SA (South Africa)

AGRICULTURE & RURAL DEVELOPMENT

- 10x20kx30
- Fortified Whole Grain Alliance
- Good Food Innovation Fund
- China Society of Forestry, Animal Husbandry, and Fishery Economics, et al. (China)
- Post-Harvest Network for Indonesian Nutrition (Indonesia)
- Kenyan Agricultural Value Chain Enterprises (Kenya)
- SokoFresh (Kenya)
- University of Nairobi (Kenya)

POLICY

- C40
- Food and Land Use Coalition
- Global Food Donation Policy Atlas
- Global FoodBanking Network
- Global Methane Hub
- Waste and Resources Action Programme (WRAP)
- World Wildlife Fund
- World Resources Institute
- China Hospitality Association, et al. (China)
- Iniciativa Climática de México (Mexico)
- Natural Resources Defense Council (US)
- Zero Food Waste Coalition (US)

INNOVATION, INVESTMENT & ENTREPRENEURSHIP

- Good Food Innovation Fund
- Planet Tracker
- ReFED Investment Platform
- Village Capital
- Kenyan Agricultural Value Chain Enterprises (Kenya)
- Sokofresh (Kenya)

PRIVATE SECTOR ENGAGEMENT

- 10x20x30
- Food and Land Use Coalition
- Global FoodBanking Network
- Planet Tracker
- Waste and Resources Action Programme
- World Wildlife Fund
- World Resources Institute
- Indonesian Business Council for Sustainable Development (Indonesia)
- Consumer Goods Council of South Africa (South Africa)
- Pacto por la Comida (Mexico)
- Pacific Coast Food Waste Commitment (US)

CONSUMER BEHAVIOR

- Food and Land Use Coalition
- Waste and Resources Action Programme
- World Resources Institute
- Shenzhen One Planet Foundation, et al. (China)
- Indonesian Business Council for Sustainable Development (Indonesia)
- Mexican Foodbanking Network (Mexico)
- Consumer Goods Council of South Africa (South Africa)
- Menus of Change University Research Collaborative (US)

MEASUREMENT, MONITORING & COORDINATION

- Food and Land Use Coalition
- Food Loss and Waste Alliance
- Waste and Resources Action Programme
- World Resources Institute
- World Wildlife Fund
- ReFED (US)

WASTE

- C40
- Global Methane Hub
- Waste and Resources Action Programme
- World Wildlife Fund

APPENDIX A: INVESTABLE OPPORTUNITIES

More information on each of the projects and organizations working across multiple geographies in this Roadmap is included below. Budget amounts include some funding for work highlighted in national roadmaps.

FOOD LOSS AND WASTE ALLIANCE. Leading experts and advocates have come together to spearhead the global effort to reduce FLW. Housed at WRI with a lean secretariat to support the effort, groups like WRAP, ReFED, WRI, FOLU, WWF, World Farmers' Organization, the Global FoodBanking Network, and Harvard Law School Food Law and Policy Clinic will build a global network of organizations working on FLW that will monitor progress, communicate publicly on the issue, share guidance and tools across locations, and catalyze new projects. The vision is that it will have global representation (e.g., at least 50% Global South participants). As part of efforts to better measure FLW, the Alliance is building out two key tools: the Food Waste Atlas, which will capture business FLW data currently missing from UN FLW indexes, and the Farm Loss Tool, a one-of-its-kind system for helping NGOs and farmers quantify often overlooked on-farm food losses and their causes. This newly forming Alliance seeks $3 million per year. It includes two related projects: 10x20x30 and 10x20kx30.

- **10X20X30.** Coordinated by Champions 12.3 at WRI, 10x20x30 aims to catalyze change through the supply chain and across geographies by working with **10** of the largest food companies including IKEA, Tesco, Carrefour, and Walmart to each engage **20** of their priority suppliers to halve their food waste by 20**30**. Because of the extensive reach of these large companies, results have been impressive in just a few years. 200+ suppliers are currently participating, including well-known brands such as Kellogg's, Grupo Bimbo and Mars, Inc. and leading companies are seeing significant reductions of up to 54% in their FLW. 10x20x30 is seeking $300,000 per year to increase the number of food companies and suppliers they reach and move to action. This work is showing what is possible by supporting leading companies to do more on FLW.
- **10X20KX30.** Building on their successful work with food companies and suppliers, Champions 12.3 at WRI has launched 10x20kx30, a new initiative to partner with **10** global and regional farm-facing agriculture companies to each engage **20,000** of their supplying farmers to reduce on-farm and near-farm food losses by half by 20**30**. Given their close connection to farmers and cooperatives, such companies are positioned to catalyze change in farming practices at scale. In partnership with 10x20kx30 and technical experts, participating companies will provide farmers with training, capacity-building, and access to finance, technology, and markets to help reduce food loss during harvest and post-harvest. Companies, in turn, will benefit from access to potential financial and technical partners that can help with on-the-ground food loss reduction efforts and increased productivity and efficiency among supplying farmers. This initiative not only helps to reduce FLW, but also helps to improve farmer livelihoods and resilience to climate shocks – it is a winning strategy for farmers, companies and the climate. 10x20kx30 seeks $350,000 per year to support this work.

C40. 70% of the world's food is consumed in cities and mayors are usually directly in charge of waste collection and treatment, making FLW reduction a clear imperative. Over 60 cities have joined C40's food systems and waste networks and accelerators, which focus on reducing FLW. C40 supports these cities to separate out organics from their waste stream, increase composting, launch consumer education campaigns, and work with the private sector on food recovery and redistribution programs. C40 seeks $14 million over three years to support their work to reduce FLW.

FOOD AND LAND USE COALITION (FOLU). FOLU works to accelerate the transformation of food and land use systems at global and national levels by forging consensus on challenges and opportunities among policymakers, businesses, investors and civil society. FOLU is composed of nine global core partners spanning various sectoral perspectives and seven country platforms including Brazil, China, Colombia, Ethiopia, Kenya, India and Indonesia. The coalition's global FLW program convenes businesses, policymakers, and civil society to advance efforts on FLW, leveraging an evidence-based approach. As part of their tailored in-country efforts, FOLU facilitates national strategies to bridge data gaps through a variety of interventions including measurement protocols, increasing the capacity of farmers, providing financial and technical support to businesses repurposing FLW, and conducting campaigns to change consumer behavior. FOLU seeks $60 million over 5 years to support national-level work and $3 million over that same period to sustain the work of FOLU's global programs on FLW.

FORTIFIED WHOLE GRAIN ALLIANCE (FWGA). Refining flour loses 30% of the grain, including vitamins, proteins, and other nutrients. Low whole grain consumption is the leading dietary risk factor contributing to the global burden of disease. While refining flour used to be necessary for better preservation, simply lowering grain moisture content enables whole grains to last longer. A pilot study in East Africa showed the feasibility of shifting to whole grains in school meals without increasing cost, with nearly 300,000 children reached. A full switch to whole grains would reduce both cropland use and greenhouse gas emissions from crops by 9%[45] and would reduce fertilizer use by 11%.[46] FWGA is supported in part by the Rockefeller Foundation. The Fortified Whole Grain Alliance seeks $7 million to reach its goal of feeding 10 million people fortified whole grains by 2025, starting in schools and other government food programs in Africa.

GLOBAL METHANE HUB (GMH). Methane has contributed 45% of recent net warming and FLW contributes 12% of global methane emissions. To address this, GMH works with national and subnational governments and state and non-state actors, including by providing funding. Its program aims to mobilize more public financing and technical resources for reducing FLW in developing countries, map private sector efforts to measure FLW, and accelerate organic waste prevention and recycling efforts in Brazil, India, Nigeria, Mexico, Indonesia, and other Global South countries. GMH is helping create the Waste Methane Assessment Platform (WASTE MAP), the first-ever global platform to use satellite monitoring to track and measure the locations and amounts of methane emissions from waste. The Global Methane Hub seeks $7 million per year for this work.

THE GLOBAL FOODBANKING NETWORK (GFN). Food banks play a major role in ensuring that healthy surplus food is recovered and redistributed to people in need, rather than ending up in landfills. GFN works with food bank partners in over 50 countries, including five of the seven priority countries in this Roadmap, by providing technical assistance, identifying food sourcing opportunities, supporting policy reforms, and mobilizing partnerships for fundraising and advocacy efforts. GFN's approach offers near-term gains by feeding people and reducing FLW, while playing a long-term role in strengthening communities and encouraging broader food systems transformation. Working with food banks across Africa, Asia, and Latin America, GFN aims to spur increases in surplus food collection and redistribution from 1% to 5% of total FLW by 2030, leading to an annual reduction of 7.5 million metric tons of greenhouse gas emissions. GFN is seeking $40 million over 7 years to deepen its impact globally and support locally-led and national food recovery and redistribution.

THE GLOBAL FOOD DONATION POLICY ATLAS. Confusing laws, gaps and ambiguities in legal frameworks, and disincentives to food donation often pose barriers to avoiding FLW. The Global Food Donation Policy Atlas, an initiative by the Harvard Law School Food Law and Policy Clinic (FLPC) and the Global FoodBanking Network (GFN), supports in-country policymakers, food system reformers, and other stakeholders in countries around the world by conducting detailed legal and policy research, providing technical support to advance policy implementation, and fostering dialogue among policymakers around the world. Their strategy has been successful – in just four years the Atlas has worked to advance national laws and policies in more than 24 countries to deter food waste and make food donations easier and safer. The Atlas is seeking $5 million over 3 years to expand the project's scope to address the full spectrum of food waste reduction policies and drive greater change in partner countries and with global stakeholders. With further funding, the Atlas could also expand to additional countries.

GOOD FOOD INNOVATION FUND (GFIF). This project seeks to make good, nutritious food available to populations facing food insecurity by fostering fledgling food-related businesses that help bring food from producers to consumers. Founded in 2021 with support from the Rockefeller Foundation, GFIF supports small and medium enterprises (SMEs) in Kenya, Burundi, and Rwanda and has a pipeline of companies in Benin and Ghana that are under review. This "incubator" is helping businesses that – in most cases – have integrated the reduction of FLW into their models. One effort is creating a cold chain for fishers in Northern Kenya to get more of their catch to market in and beyond the region. Another is purchasing produce rejected by exporters and transforming it into high protein stew for resale to institutional customers (hospitals, schools, refugee camps). With GFIF's technical and financial support, SMEs are able to attract investment, scale operations, expand market bases, and become sustainable. GFIF is seeking $5 million over five years to expand the number of businesses it supports and move into Nigeria as well as other Sub-Saharan African countries, allowing it to leverage networks and other resources from the UN World Food Programme.

PLANET TRACKER. Planet Tracker is a non-profit financial think tank using private finance as a lever for change, producing analytics and reports to align capital markets with planetary boundaries. Planet Tracker's Halving Food Loss & Waste program aims for financial institutions to include FLW in their funding decisions and how they engage with food system companies. This drives change in the food system itself, as food producers, manufacturers, retailers, and food service companies establish plans and policies to significantly reduce FLW in response to the pressure from financial institutions. This work will show the cost of FLW to individual companies, the food system as a whole, and the financial institutions that fund it, as well as the profits and investment returns to be gained from improvements. Planet Tracker works directly with different actors in the financial system and acts as a financially literate watchdog of company behavior. Planet Tracker's work on FLW is one piece of a broader effort to make the food system more sustainable. Planet Tracker is seeking at least $3 million over three years for this work.

ReFED INVESTMENT PLATFORM. Entrepreneurs and established businesses are innovating and developing new approaches to reducing FLW that return profits by improving efficiency, finding upcycling possibilities, and reducing waste. Seeing an opportunity to bring new and significant sources of funding into FLW efforts, ReFED is combining its issue expertise about loss and waste in supply chains with staff experience in the investment sector to develop an investment strategy that would drive a first-of-its-kind, full-spectrum investment platform. The Platform would deploy below-market-rate-equity, debt, and grant capital in a coordinated fashion to support development, testing, adopting, and scaling of FLW solutions. With a target amount of $100 million, the platform has the capacity to invest in ideas wherever they come from and wherever they can be deployed. ReFED is currently seeking one or more investment fund managers to serve as strategic

advisors and partners on this project. It estimates that the platform will catalyze at least five times the amount of funding invested, while also acting as a potential model for others to create FLW-dedicated funds around the globe. The ReFED Investment Platform requires a minimum investment of $50 million to start.

VILLAGE CAPITAL. Village Capital provides funding, training, peer learning opportunities, and other help to build and grow viable businesses focused on climate innovation and adaptation. It then provides connection to private capital investors, a critical next step in helping start-ups to scale into sustainable enterprises. Working in Latin America, South Asia, Sub-Saharan Africa, the Middle East and North Africa region, Europe, and the US, the organization has honed its accelerator model and advanced a variety of FLW efforts. The Future of Food Latin America project (in collaboration with the Visa Foundation) featured FLW as a focus for eligible participants. The O-Farms program in East Africa (with the IKEA Foundation) centered on supporting circular agriculture business development. Conscious of bias in the sector, Village Capital intentionally seeks to support women-led start-ups in addition to other underrepresented groups. Village Capital also provides expertise and infrastructure for impact investors seeking to mobilize philanthropic (or other) capital in the private sector through mission-related investments and program-related investments. Village Capital requires $5 million over three years to launch new accelerators for small and medium enterprises with a FLW focus.

THE WASTE AND RESOURCES ACTION PROGRAMME (WRAP). The United Kingdom has demonstrated that major reductions in FLW are possible. The country's sustained cuts of 27% overall (and 31% of household food waste) came as the result of many factors. WRAP has been at the center of the effort, demonstrating the need for and ability to lead a systems-level intervention to achieve such impact. As WRAP continues work to help the UK reach 50% reductions, it is providing strategic, technical, and financial support to FLW reduction efforts in countries around the world. This currently includes work in Mexico, Indonesia, South Africa, Brazil, Colombia, and the United States. WRAP's approach entails intense support to help local organizations get off the ground, with decreasing involvement over a three-year period as local partners gain capacity. WRAP seeks an estimated $35 million for this work over the next 5 years.

WORLD WILDLIFE FUND (WWF). WWF's Circular Food Future Initiative addresses FLW as part of a broader effort to promote circular food economies in countries around the world. It combines global perspective and network resources with local knowledge and capacity, adapting a broad-based array of strategies that target FLW across the food system. The work includes policy advocacy (organics bans, food donation regulations), impact investment in promising technological solutions (cold chain, startups), private sector engagement (hotel and hospitality sectors) and consumer behavior (education campaigns). Currently working in 24 countries (including four of the seven featured in this roadmap), this project seeks to pursue work to support 35 countries in meeting the SDG 12.3 goal of 50% food waste reductions by 2030. WWF seeks $21 million over five years to build out and sustain this campaign, with the majority of funding supporting local partners.

APPENDIX B: NATIONAL ROADMAPS

BRAZIL

WHY BRAZIL?

While Brazil's efforts to address food loss and waste (FLW) are at a nascent stage, the potential impact of addressing the issue in the country is significant thanks to a favorable political environment and growing external focus on the country in the lead up to Brazil hosting the G20 in 2024 and the climate negotiations in 2025.

Brazil is the world's seventh largest country by population and ninth largest by gross domestic product (GDP). It is among the world's largest agricultural suppliers and its role is expected to become more significant in the coming years given current growth trends in the sector.[1] Growing demand for beef and other meat in Brazil and globally has driven deforestation of the Amazon to clear space for grazing and agriculture, with much of the deforested land used to grow animal feed.[2]

Despite the country's economic and agricultural abundance, deep social inequality in Brazil means that reducing hunger is a priority. Nearly one-third of all Brazilians face moderate or severe food insecurity.[3] Hunger is at the top of the current administration's policy goals, captured in Plano Brasil Sem Fome (Brazil without Hunger Plan). The plan is ambitious: seeking to help 95% of households be food secure by 2030. Reflecting environmental concerns, the plan envisions hunger reduction through sustainably produced food and includes reducing food waste from farm to plate within its measures. The administration has also been outspoken on climate issues – particularly deforestation. President Luiz Inácio Lula da Silva has announced combating hunger and promoting sustainable development as priorities for the G20 in 2024.[4]

OPPORTUNITY FOR IMPACT

With opportunity for impact, the existing presence of multiple international actors, and connection to domestic priorities, philanthropic funding can catalyze coordinated action on FLW in Brazil. Currently, there is some activity on the issue at the local and national level, including a national food bank operating in all 26 states. The moment is ripe for global philanthropy to collaborate with Brazilian funders and bring increased resources to support stronger coordination and strategic alignment among national and international organizations on this issue.

Given the early stage of efforts on the issue, funding FLW work in Brazil will support scoping work and capacity building for national groups with support from global partners. UN Environment Programme (UNEP), Food and Agriculture Organization of the UN (FAO), Global FoodBanking Network, Village Capital, the Waste & Resources Action Programme (WRAP), World Resources Institute (WRI), and World Wildlife Fund (WWF) are active in Brazil and eager to support local actors.

BY THE NUMBERS[5]

POPULATION

216M

PEOPLE WITH MODERATE OR SEVERE FOOD INSECURITY

32.8%

ANNUAL FOOD WASTE

22 **metric tons**
103 KG PER CAPITA

ANNUAL ECONOMIC COST OF FLW (USD)

$53B

TOTAL ANNUAL GREENHOUSE GAS EMISSIONS FROM FLW

277 **million metric tons of CO2e**
(Without Land Use Change*)

SIGNATORY TO SUSTAINABLE DEVELOPMENT GOAL 12.3

YES

CHINA

WHY CHINA?

China presents an unparalleled opportunity for progress and impact when it comes to reducing food loss and waste (FLW). The second largest country by population, China is the world's top agricultural producer.[1] Approximately 300 million tons of food are lost each year in China during the processing and storage stages, equivalent to a loss rate of 30%. At the consumer end of the system, 22% of food — equivalent to 160 million tons — is wasted in homes, restaurants, and other dining areas.[2] Overall, China's scale of FLW is so great that reducing it by 50% would not only reduce 320 million tons of greenhouse gas emissions annually but could also meet the food and nutrition demands of 400 million people, save 300 million cubic meters of water, reduce demand for 40 million hectares of agricultural land, and significantly decrease fertilizer pollution (reducing emissions of nitrous oxide).[3]

Concerned about food insecurity, growing dependence on food imports, and climate impacts, the Chinese government has taken action to address the problem. In 2013, the government began a "Clean Your Plate" campaign to encourage consumer behavior change.[4] In 2021, the government added sanctions to the campaign, targeting the catering and restaurant sectors where waste is most prevalent. This Anti-Food Waste Law requires all sectors to set food waste reduction targets, measure their waste, implement reduction efforts, and disclose progress. Likewise, the National Development and Reform Commission and the State Administration for Market Regulation require local governments and food companies to measure, take action, and track progress on FLW reduction. China also included FLW reduction in its landmark "carbon peaking before 2030" plan and in its "carbon neutrality before 2060" plan.[5] Since then, nearly all 31 sub-national jurisdictions in China have released local plans for reducing FLW.

Policy think tanks, environmental groups, industry associations, and academics are coming together to support and complement government action. Together they are developing, testing, and scaling solutions. Targeted philanthropic investments can play a role in accelerating this work and improving both food and climate security.

BY THE NUMBERS[6]

POPULATION

1.4B

PEOPLE WITH MODERATE OR SEVERE FOOD INSECURITY

7.1%

ANNUAL FOOD WASTE

179 **metric tons**
126 KG PER CAPITA

ANNUAL ECONOMIC COST OF FLW (USD)

$272B

TOTAL ANNUAL GREENHOUSE GAS EMISSIONS FROM FLW

455 **million metric tons of CO_2e**

SIGNATORY TO SUSTAINABLE DEVELOPMENT GOAL 12.3

YES

HIGH-IMPACT PRIORITIES

SUPPORT PROVINCIAL IMPLEMENTATION OF THE ANTI-FOOD WASTE LAW

Implementation of China's landmark Anti-Food Waste Law rests with provincial governments. Most provinces are seeking advice, insights on best practices from elsewhere, and practical guidance on how to quantify food waste, identify loss and waste hotspots, prioritize solutions, and track progress. A collaborative of national and international partners, including the China Hospitality Association, China Chain Store and Franchise Association, Shenzhen One Planet Foundation, World Resources Institute (WRI) China, and World Wildlife Fund (WWF)-China, are already supporting efforts in cities including Beijing, Shanghai, and Hangzhou and provinces such as Zhejiang and Yunnan, which together constitute 24% of the nation's population.[7] **The collaborative seeks $750,000 per year for three years to expand support for food waste reduction programs to the provinces of Shandong and Sichuan (an additional 13% of the population). Additional provinces may be supported at approximately $250,000 per year per province.**

LAUNCH PROVINCIAL FOOD LOSS REDUCTION PROGRAMS FOR FARMER COLLECTIVES

Vast amounts of food are lost during on-farm and post-harvest handling in China. Local agriculture authorities, small businesses, and farmer collectives would benefit from additional capacity and increased incentives to adopt more effective practices. Action focused on farmers at harvest and post-harvest stages will adapt policy to local contexts, create financial incentives, provide technical support, and run training programs. This work will start in Jiangsu, Heilongjiang, and Hubei provinces. **The non-profit China Society of Forestry, Animal Husbandry, and Fishery Economics seeks $1 million per year on behalf of a collective that includes the Vanke Foundation, Society of Entrepreneurs and Ecology (SEE) Foundation, and local NGOs.**

ESTABLISH CROSS-SUPPLY CHAIN PARTNERSHIPS

FLW is happening at every link in the supply chain. With government policies putting economic pressure on food supply actors, there is new incentive for improvement from production through retail stages. National and international groups are working together to convene large-scale purchasers including brands, fast-moving consumer goods companies, retailers, and restaurants. Together, they intend to expand adoption of more efficient approaches from farm to final sale, including better packaging, tracking, storage, and other solutions. **WRI-China, WWF-China, the Chinese Chain Store and Franchise Association, and other partners seek $1.5 million per year for three years to roll out programs to 100+ companies, driving significant reductions in FLW in China's food supply chain.**

REDUCE CONSUMER WASTE WHERE IT OCCURS MOST

Chinese restaurant and catering sectors are widely seen as drivers of high levels of food waste at the consumption end of the food system. Influenced by a culture that values abundance at celebrations and banquets, surplus food following such events is a major factor in food waste. Under threat of fines and penalties, food businesses are expected to reduce serving sizes, deter over-ordering, and ensure excess food is not thrown away. To adapt, the sector needs systematic pathways and innovative tools to better prevent, measure, divert, and reduce a minimum of 10% of food waste. Shenzhen One Planet Foundation (with implementing partners such as WWF-China, Rare Center for Behavior and Environment, and Rare Europe) are working with the catering industry in China to provide training, develop pilot projects, advocate for improved policy and industrial guidelines, and develop public education campaigns. The project includes collaboration with two major food delivery platforms, the China Hospitality Association, and regional industrial associations. 50 restaurants across 6 cities have joined pilot programs. **Shenzhen One Planet Foundation and partners seek $1 million per year to scale the program nationally.**

INDONESIA

WHY INDONESIA?

With the world's fourth largest population and the largest economy in Southeast Asia, Indonesia's efforts to reduce food loss and waste (FLW) have the potential for significant impact at national, regional, and global levels.[1] The country's development planning agency estimates FLW causes 7% of the country's greenhouse gas emissions and results in economic losses of $13-15 billion per year, or 4-5% of gross domestic product (GDP).[2] At the same time, 8% of the population faces food insecurity, a situation that could be entirely resolved through improved food recovery and redistribution.[3]

With one of the world's most extensive rain forests, minimizing FLW can reduce the pressure to deforest. Indonesia's vast fisheries sector also offers an opportunity to test and scale solutions that can be adapted in other countries dependent upon fish as a major source of food.

The Indonesian government has made reducing FLW a national priority. The national government is actively diagnosing the causes of the problem and developing action plans including some that will use FLW to contribute to creating a circular economy. Plans include improving storage systems and other ways to support farmers to reduce post-harvest loss, efforts to increase upcycling and composting, and policy shifts to provide reliable data on FLW, encourage food donation, and discourage informal waste management practices. At the sub-national level, two provinces have adopted landfill regulations regarding food waste.

Much of the work in Indonesia is built around collaborative efforts that engage issue experts, the private sector, government, and civil society to develop and implement solutions on FLW, many of which link climate concerns with hunger and nutrition. Currently, two public-private partnerships are underway to reduce FLW across the supply chain: one focused on the "farm to fork" supply chain and the other centered on the "sea to stove" supply chain.

Philanthropic funding can leverage and complement government resources and amplify important efforts taking place across the country.

BY THE NUMBERS[4]

POPULATION

278M

PEOPLE WITH MODERATE OR SEVERE FOOD INSECURITY

4.9%

ANNUAL FOOD WASTE

33 **metric tons**
121 KG PER CAPITA

ANNUAL ECONOMIC COST OF FLW (USD)

$15-39B

TOTAL ANNUAL GREENHOUSE GAS EMISSIONS FROM FLW

180 **million metric tons of CO2e**
(Without Land Use Change*)

SIGNATORY TO SUSTAINABLE DEVELOPMENT GOAL 12.3

YES

HIGH-IMPACT PRIORITIES

SCALE PUBLIC-PRIVATE PARTNERSHIPS ON FOOD LOSS AND WASTE

Work on reducing FLW in the supply chain is being led and coordinated by the Indonesian Business Council for Sustainable Development (IBCSD), a public-private partnership within the Indonesia Chamber of Commerce dedicated to advancing the UN Sustainable Development Goals. In 2021, IBCSD launched Gotong Royong Atasi Susut & Limbah Pangan di Tahun 2030 (GRASP2030): an initiative bringing together business, government, and civil society to address FLW through a range of projects, as well as piloting a consumer behavior campaign (see below). With the Waste & Resources Action Programme (WRAP) as a technical partner, initial work raised awareness about the issue and moved it up in the national agenda. Now with 23 initial signatories engaged, GRASP2030 has begun its implementation phase. Current projects within the initiative span the supply chain: training on the "target, measure, act" approach to reducing farm loss; a hotel chain testing Leanpath technology to identify opportunities to reduce waste; and various efforts to divert food waste from landfills through redistribution, upcycling, and use as feed for livestock and fish. **IBCSD seeks $2 million per year for three years to scale up the GRASP2030 initiative, develop roadmaps at the sub-national level, bring on more partners, expand measurement and reporting, and enable activity across the supply chain.**

ADDRESS FOOD LOSS IN FISHERIES

Made up of more than 17,000 islands, Indonesia is particularly dependent on fishing as a source of food. The Post-Harvest Network for Indonesian Nutrition (JP2GI) has been working since 2018 to improve the domestic supply of nutritious food and improve the livelihoods of fishers and others in the food system, all by reducing post-catch rates of loss. The network aims to reduce loss by 25-35%. JP2GI works with experts, government agencies, financial institutions, and actors across the supply chain: educating and supporting fishers in use of cold chain (temperature-controlled supply chain); facilitating business development rooted in climate-friendly technology; and supporting communities seeking to address food insecurity and improve economic well-being. It brings an "open source" approach, sharing successful innovations across the network. JP2GI also works with the government to encourage structural improvements, examine national policies, and unlock funding for capacity and infrastructure. **JP2GI seeks $1.5 million per year for three years to expand its reach across Indonesia, deepen support for business development, and scale models showing high impact.**

SHIFT CONSUMER BEHAVIOR

IBCSD is also spearheading efforts to reduce waste at the consumer level through Consumindful, a pilot behavior change campaign. IBCSD launched the pilot in 2023, with WRAP providing methodological and strategic expertise to support IBCSD's collaboration with community organizations, schools, universities, national and regional governments, and the national hotel and restaurant trade group. Messages and approaches reflect the culture and contexts in Indonesia. One effort targets adults between ages 18 to 35 – an important age group due to a combination of "high waste" lifestyles, digital savvy, and environmental awareness – to encourage both waste prevention at home and food donation practices. Another pilot during Ramadan focused on encouraging children to link reducing FLW with other religious behaviors at a time when food waste is acute. Pilots are coming to an end this year and insights gained from these efforts will help determine the strategy for a larger campaign in 2024 and beyond. **IBCSD seeks $2 million over three years to increase the scope and reach of the campaign, with a larger goal of $10 million over three years to expand the campaign across the country.**

KENYA

WHY KENYA?

Kenya presents a compelling case for work to reduce food loss and waste (FLW). Agriculture and related sectors contribute over 50% of gross domestic product (GDP) and 65% of export revenues.[1] Yet, the amount of food not consumed is over 40%[2] and more than two-thirds of all Kenyans face food insecurity.[3] If left unaddressed, these problems are projected to worsen with time, impacting the country's people, economy, and environment. Exciting efforts are underway in rural and urban settings to scale tested solutions on FLW and contribute to a circular economy. Other efforts seek to reduce on-farm and post-harvest loss and improve farmer livelihoods by building stronger links between farmers and buyers for their crops. Local results are having international implications – solutions developed in the Kenyan context are already finding applications well beyond the country's borders.

The Kenyan government has taken important steps in addressing FLW, starting with ratification of the African Union's Malabo Declaration, which includes a commitment to reduce post-harvest loss by 50% by 2025. As the government builds out a post-harvest management strategy (expected by the end of 2023), Kenya has financed the establishment of the Warehouse Receipt System (WRS). The WRS involves construction of certified warehouses with optimal storage conditions where farmers can deposit commodities (grain, beans, coffee, tea, etc.) and receive receipts to trade on the value of the commodity and to use as collateral on loans.

Government action is complemented by an active ecosystem of international, multilateral, and national efforts to increase harvests, expand access to healthy food, and build a sustainable, environmentally-sensitive business sector that can improve economic outcomes for smallholder farmers and rural communities more broadly. Many of these projects include efforts to reduce post-harvest loss and reduce waste further down the supply chain.

Targeted philanthropic interventions on FLW can leverage the significant philanthropic, bilateral, and multilateral funding already flowing to Kenya to support and scale solutions that simultaneously improve food security, rural economic outcomes, and nutrition.

BY THE NUMBERS[4]

POPULATION

55M

PEOPLE WITH MODERATE OR SEVERE FOOD INSECURITY

72%

ANNUAL FOOD WASTE

7.4 **metric tons**
141 KG PER CAPITA

ANNUAL ECONOMIC COST OF FLW (USD)

$655M

TOTAL ANNUAL GREENHOUSE GAS EMISSIONS FROM FLW

26 **million metric tons of CO2e**

SIGNATORY TO SUSTAINABLE DEVELOPMENT GOAL 12.3

YES

HIGH-IMPACT PRIORITIES

ESTABLISH A GOVERNMENT-APPROVED PROTOCOL ON FLW MEASUREMENT AND DATA

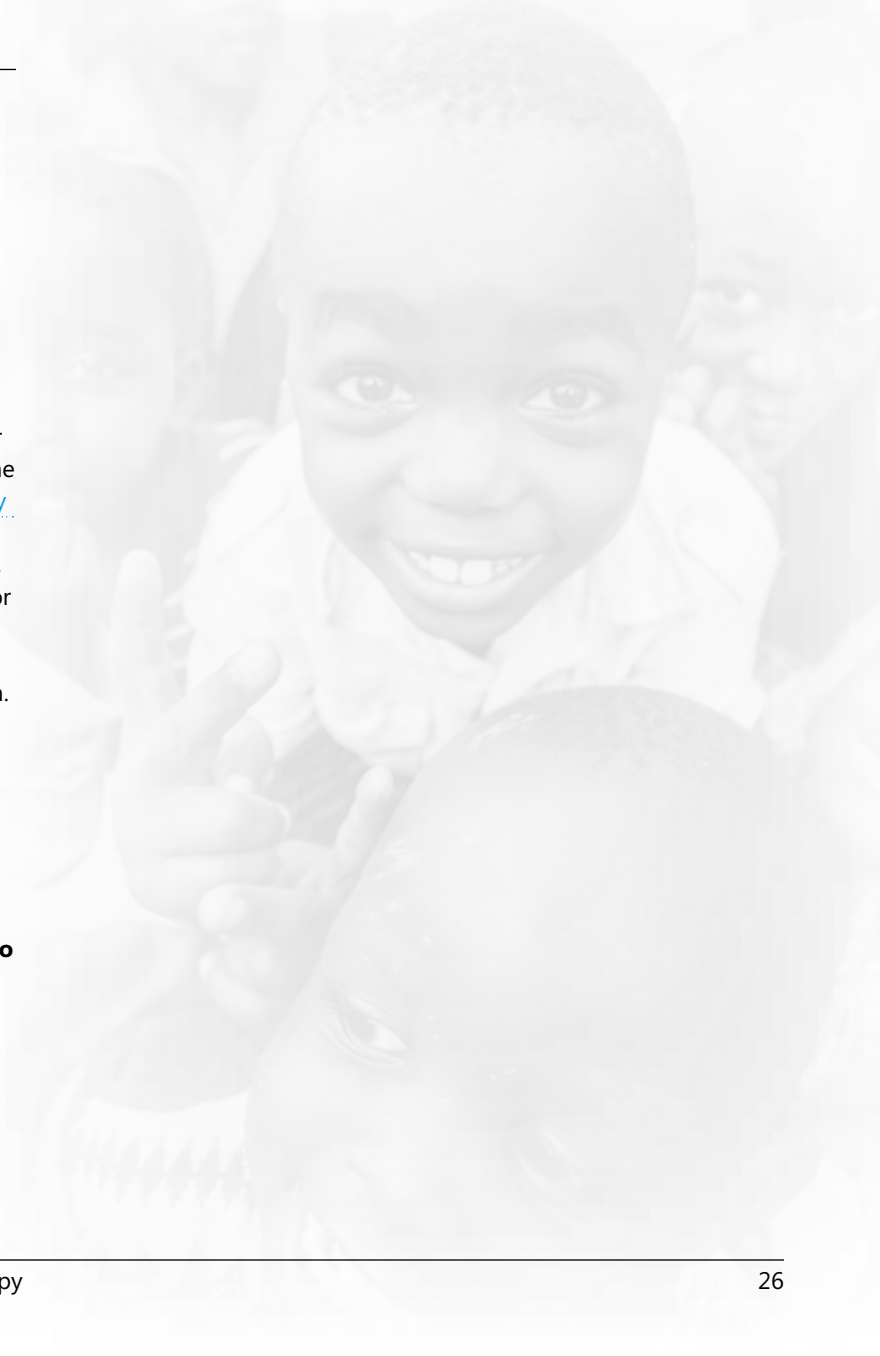
Reliable data can serve to identify FLW hotspots within value chains, help assess progress, and spur action. Efforts to reduce FLW in Kenya will have greater focus and impact if they are based on accurate measurement and updated data. The Food and Land Use Coalition (FOLU) and its local partners have begun work to develop a FLW measurement protocol in Kenya informed by global best practice tailored to the local context (given variations in what data is collected and how it is currently measured). Data gathered will be used to inform the Kenyan government's FLW reduction strategy, identify needed policy reforms, and drive private sector and philanthropic interventions to where they can have the most impact. **FOLU seeks $3 million over the next three years to finalize the development of the measurement protocol and ensure that government statistical services and partners are trained to use it effectively.**

SCALE SOLUTIONS FOR SMALLHOLDER FARMERS

Smallholder farmers make up the vast majority of the agricultural sector in Kenya. Access to basic technologies (such as silos and drying facilities) or more complex infrastructure (such as cold chain – temperature-controlled supply chain) or access to market information) can help farmers bring more of their harvest from farm to market. Multilateral, bilateral, and philanthropic efforts have helped develop and test a number of proven solutions now ready for scaling. For instance, the Kenyan Agricultural Value Chain Enterprises (KAVES) initiative has brought together the government and the dairy and maize sectors to improve the efficiency and sustainability of their value chains. The University of Nairobi has piloted various low-cost innovations to address food loss such as "zero-energy brick coolers" that use low-cost, low-tech evaporative cooling to create cold storage capacity for farmers and others along the supply chain. Local social enterprises like SokoFresh are working to scale solar-powered refrigeration solutions to rural and fishing villages across Kenya. Emerging businesses supported by the Good Food Innovation Fund provide grain storage and processing, increasing yields going to market while reducing methane-producing waste. Village Capital has launched a circular agribusiness incubator – O Farms – working in Kenya and Uganda with entrepreneurs upcycling food that would otherwise be wasted into saleable and nutritious products. **Financing any of these partners starting at $1 million per year for three years would help to scale post-harvest solutions, with significant benefits for nutrition and incomes for smallholder farmers.**

CATALYZE A CIRCULAR ECONOMY SOLUTION FOR FOOD LOSS AND WASTE

In Kenyan cities, especially Nairobi, retail and consumer food waste is significant. One reason for high consumer food waste rates is that produce arrives at markets in poor condition because of a lack of access to cold chain, with fish or produce spoiling before it can be sold or consumed. World Wildlife Fund (WWF)-Kenya is working to build out cold storage in Kenyan marketplaces so that produce can stay fresh longer. These "aggregation shops" serve as a collection point for farmers and a wholesale source for hotels and other buyers. Remaining waste can be turned into animal feed, for example through black soldier fly farming (where waste is used to breed and harvest larvae that can be used as animal feed) or into compost for use by farmers in need of fertilizer. **WWF-Kenya seeks $2 million over 3 years to support this work through its African Food Futures Initiative.**



MEXICO

WHY MEXICO?

Given its large population, high per capita food loss and waste (FLW), role as a significant global food supplier, and influence within the Latin America and Caribbean region, Mexico is a priority country for action on FLW. By reducing FLW, Mexico can address a number of acute problems including food security and nutrition, rural poverty, water scarcity, and greenhouse gas emissions.

While the scale and impact of FLW across the supply chain is still being examined, current evidence shows it is most acute at each end: production (on-farm losses) and consumption (food waste in households).[1] While Mexico is the tenth largest food producer in the world[2], intensifying drought is creating strong incentives to make the most of shrinking fresh water supplies.[3] Since 75% of the country's water is used for agriculture production, and up to one third of Mexico's food production is lost or wasted, approximately 25% of Mexico's water is potentially used unproductively.[4] Mexico also has a highly-urbanized population where household food waste levels (an estimated 137 kg/per capita/year) are markedly higher than any other country in Latin America and the Caribbean.[5]

Mexico's previous administration collaborated with the World Bank to begin development of a national strategy to reduce FLW. While that effort is now on hold, the environmental agency Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT) is developing a circular economy strategy that presents an opportunity for putting FLW back on the federal government's agenda.

Action is already underway in Mexico with Red de Bancos de Alimentos de México (Red BAMX) leading a coalition of food-related businesses, NGOs, and trade associations joining forces to initiate Pacto por la Comida (Pact for Food), a national voluntary agreement to reduce food waste by 50% by 2030. With national and multinational food companies including Bimbo, Walmart, Herdez, Unilever, and Nestlé on board, this initiative is setting the overall strategy and coordinating efforts across the country, with two promising initiatives seeking funding as noted below. Pacto por la Comida is the first national public-private partnership on FLW in Latin America and the Caribbean and is already attracting interest from organizations in Argentina, Colombia, and Ecuador. Moreover, Waste & Resources Action Programme (WRAP), World Wildlife Fund (WWF), the Global Foodbanking Network, and the Harvard Food Law and Policy Clinic are all engaged in supporting Pacto por la Comida and its signatories.

BY THE NUMBERS[6]

POPULATION

128M

PEOPLE WITH MODERATE OR SEVERE FOOD INSECURITY

27.6%

ANNUAL FOOD WASTE

17.5 **metric tons**
137 KG PER CAPITA

ANNUAL ECONOMIC COST OF FLW (USD)

$25B

TOTAL ANNUAL GREENHOUSE GAS EMISSIONS FROM FLW

100 **million metric tons of CO_2e**

SIGNATORY TO SUSTAINABLE DEVELOPMENT GOAL 12.3

YES

HIGH-IMPACT PRIORITIES

INFLUENCE THE POLICY LANDSCAPE

Shaping policy and supporting government-level solutions to reduce FLW are essential to long term success. Iniciativa Climática de México (ICM) has a well-deserved reputation for finding ways to advance climate policy in a dynamic political context. The 2024 national elections present a particularly important opportunity to educate the public and candidates on FLW and its solutions. With stronger national policies, ICM will work with 3-5 states to implement food loss and waste programs, all in coordination with other groups active on the issue across Mexico. ICM is a trusted partner for governments, funders, and others seeking to engage on climate in Mexico, serving as a connector with allies in the government and NGOs. On FLW, ICM is already working with the Global Methane Hub, among others, on measuring, tracking, and reducing food waste in landfills. An experienced re-grantor, ICM is using their understanding of the country's climate ecosystem to identify partners for support. **ICM seeks $1 million per year for three years to shape and set strong FLW policy, then support state-level implementation of FLW plans.**

SCALE COLLABORATIVE ACTION ACROSS THE SUPPLY CHAIN

Pacto por la Comida signatories have committed to reporting their FLW each year so progress can be tracked, collaborating with other signatories to change policy and improve business operations, and reducing their own FLW by 50% each. Led by Red BAMX in collaboration with WRAP, in its first two years the Pacto team has worked with Bimbo Group, Nestlé, and others to establish FLW measurement standards and practices and pilot efforts to address hot spots. An early win by Pacto and Bimbo Group has saved raw ingredients from being trashed on a scale of more than 400 kilos per week, with around 30 tons of food rescued since July 2022. With additional funds, Pacto por la Comida can recruit additional signatories, further refine and adopt measurement and diagnosis efforts, coordinate working groups on sector-specific problems, provide technical assistance to companies, and facilitate exchange of best practices and lessons learned. **Pacto por la Comida seeks $2 million per year for three years to scale the partnership in numbers and scope.**

ENHANCE FOOD DONATION CAPTURE AND PROCESSING CAPACITY

Food banking offers immediate impact — preventing FLW and helping those who face food insecurity while other efforts get underway. Active since 1996, Red BAMX operates 57 food banks in 29 of Mexico's 32 states, preventing 150 million kilos of food from being wasted every year and avoiding more than 221,000 tons of CO2e.[7] Scaling Red BAMX's efforts to recover food (primarily fresh fruits and vegetables from farms and food markets) and redistribute it, requires expanding its network of food donors and establishing a stronger logistical infrastructure for recovery, preservation, and distribution. Support would also allow a significant increase of technology and digital tools to track and facilitate food rescue activities, connecting food surpluses with food banks and food insecure communities. Feeding America's Southwest Boundless Collaboration is supporting Red BAMX in building out state and local food banks in Mexico and providing logistics expertise that helps expand recovery capacity to feed people across Mexico and beyond. **BAMX seeks $2.5 million per year for three years to double its recovery and redistribution work.**

ENCOURAGE CITIZEN BEHAVIOR CHANGE

With start-up support from the Posner Foundation of Pittsburgh, Pacto por la Comida, Red BAMX, and WRAP began collaboration on a national citizen behavior change campaign to reduce consumer-level food waste and encourage healthier diets. Based on lessons learned from successful campaigns in the UK (where household food waste is down 31%) and recently completed research in Mexico, the first phase of the effort focuses on raising awareness, with messages and operational interventions from retailers, brands, and in the hospitality and food service sectors. The second phase will pilot efforts to shift behaviors related to waste and diet choice (towards plant-based foods). Additional support will allow Pacto por la Comida to adapt based on the pilot and scale nationwide. **Pacto por la Comida seeks $1.5 million per year for three years to scale the reach and impact of its consumer campaign.**

SOUTH AFRICA

WHY SOUTH AFRICA?

South Africa has the potential to become a world leader on reducing food loss and waste (FLW). A government study estimates that 45% of the available food supply is lost or wasted annually in the country, while 60% of households are food insecure.[1] FLW causes 7% of South Africa's greenhouse gas emissions[2] and a 2% loss of GDP.[3] 20% of potable water goes to producing food that is never eaten[4], so reducing FLW could help South Africa weather severe droughts. Because it exercises great political and economic influence in the region and continent, changes in South Africa can shape policy and practices well beyond its borders. Though still in early stages, national action on the issue is well underway.

The South African government has made reducing FLW a priority, as have a number of provincial governments. The national government's draft Strategy for Reducing Food Losses and Waste, currently published for public comment, takes a systemic approach to FLW rooted in broader commitments to reimagining food systems and building a circular economy. It also sets an ambitious goal of reducing organic waste in landfills by 70% within 15 years. This builds upon work underway by multiple government agencies to develop and implement solutions across food and waste systems.

Civil society is also active on FLW – from pressuring the government to be bold as they develop and implement the national strategy to supporting efforts to test solutions and achieve impact. For example, the South African Food Loss and Waste Initiative, a public-private partnership, has already signed on food retailers representing more than 80% of formal market share, as well as manufacturers, sectoral associations, and issue experts (see more below). Together they are building out measurement systems and protocols, identifying loss and waste hotspots, and testing and scaling solutions. Food recovery efforts are ramping up in tandem to expand surplus food redistribution and reduce waste.

With multiple actors across sectors already leaning in on this issue, philanthropic funding can play a timely and outsized role in increasing the pace and ambition of the efforts to reduce FLW.

BY THE NUMBERS[5]

POPULATION

60M

PEOPLE WITH MODERATE OR SEVERE FOOD INSECURITY

20.3%

ANNUAL FOOD WASTE

4.9 **metric tons**
83 KG PER CAPITA

ANNUAL ECONOMIC COST OF FLW (USD)

$3.8B

TOTAL ANNUAL GREENHOUSE GAS EMISSIONS FROM FLW

24 **million metric tons of CO2e**

SIGNATORY TO SUSTAINABLE DEVELOPMENT GOAL 12.3

YES

HIGH-IMPACT PRIORITIES

DEEPEN ACTION THROUGH A NATIONAL PUBLIC-PRIVATE PARTNERSHIP

In 2020, with financial and technical support from the Waste and Resources Action Programme (WRAP), the Consumer Goods Council of South Africa (CGCSA) launched the South African Food Loss and Waste Initiative to support reduction efforts at every point in the food supply chain, including waste management and composting. Now with 115 signatories – including agriculture associations, grocers, food manufacturers, civil society, and government agencies – strategic activities are underway. These include implementation of measurement and reporting practices, developing surplus food recovery and redistribution practices, and shaping law and regulations. Results can already be seen. In the first three years of the initiative, Pick n Pay — a major grocery chain with markets throughout Southern Africa — has reduced its waste by 28%[6] and diverted 62% of its general waste from landfills.[7] Expanded funding will allow more ambitious efforts, particularly at farm-level and the consumption stage, with increased technical assistance on intervention projects among the ripest for expansion. It will also allow for a consumer behavior campaign targeting urban populations focused on health and sustainability in diets. The Initiative has set a goal of 25% FLW reductions by 2025 and 50% reductions by 2030. **The South African Food Loss and Waste Initiative seeks $4 million annually for three years to support the work of the public-private partnership and to run their consumer behavior change campaign.**

INFORM AND SHAPE THE POLICY LANDSCAPE

Advocates in South Africa are pushing for policies that could make the country a regional and global leader on FLW. Current priorities include implementing effective regulations on date labeling that will help reduce household food waste (including by using government funding for consumer education on the changes in date labels) and changing liability laws to encourage food donation. Key advocates on this issue include World Wildlife Fund (WWF)-South Africa, the CGCSA, FoodForward SA, and others. **WWF-South Africa seeks $100,000 annually for three years to support staffing dedicated to FLW policy and efforts.**

EXPAND FOOD RECOVERY TO FEED MORE PEOPLE

The South African government's draft FLW strategy has a large food redistribution component. Led by both government and the private sector, food redistribution has the potential for dramatic impact in a country with a productive agricultural sector, high levels of food insecurity, and significant social inequality. National and provincial governments are scaling up efforts to alleviate household food insecurity by increasing food recovery and distributing that food through nutrition development centers. Private efforts — led primarily by FoodForward SA — complement those government programs, targeting surplus food recovery at various points along the supply chain, including hotels, restaurants, food manufacturers, and grocers. FoodForward SA plans to redistribute 22,120 metric tons of food to 1 million people (1.6% of the population) by providing food to organizations across the country centered on early childhood development, vulnerable women and children, and health and skills development.[8] FoodForward SA aims to double the food they are redistributing by 2030. This requires growing the infrastructure necessary for recovery and redistribution, as well as funding to engage in policy related to food donation and recovery, such as the liability laws mentioned above. **FoodForward SA requires $3.5 million over three years to expand its infrastructure and network and double its annual redistribution work.**

UNITED STATES

WHY THE UNITED STATES?

The United States (US) offers enormous opportunities for reductions in food loss and waste (FLW). The world's third most populous country, the US loses or wastes an estimated 180 billion pounds of edible food annually.[1] At the retail and consumer levels alone, this is an economic loss of $162 billion.[2] Food waste represents 24% of inputs to US landfills, which are the country's third-largest source of human-caused methane at 15%.[3] According to the EPA, diverting food waste from US landfills would reduce methane generation potential by 33%.[4] The fact that cities are struggling to find ways to address landfill space and cost challenges creates additional incentives to divert food from landfills.

Efforts in the US are already underway and showing impact. After peaking in 2018, FLW rates have flattened. There has been slow but steady progress in reducing landfill methane emissions. Nine states, representing 25% of the US population, have adopted laws to keep food waste out of landfills.[5] A growing number of cities – including New York City – are requiring organic material (like food scraps and yard waste) be diverted from household trash. The federal government, which has maintained its commitment to Sustainable Development Goal (SDG) 12.3 (a target of 50% food waste reductions by 2030) through three administrations, is currently bullish on FLW, channeling growing sums into work on the issue domestically and overseas. Because Americans are among the top per capita meat consumers in the world,[6] the US is also a good testing ground for solutions to reduce FLW from meat, dairy, and other animal products.

Adding to the hopeful atmosphere in the US on this issue is the vibrant and effective ecosystem of groups tackling FLW at the national, state, local, and hyper-local levels. ReFED, discussed in more detail below, is a nonprofit organization entirely focused on the issue, providing essential data collection, analysis, and solution-identification. It works closely with well-known organizations such as the Natural Resources Defense Council (NRDC), Environmental Defense Fund (EDF), and the World Wildlife Fund (WWF) and is connected to over 1,800 groups working at state and local levels. Those groups provide both depth and breadth to the field, as well as valuable grassroots engagement. Food industry corporations are also increasingly engaged, seeing FLW as a way to simultaneously advance environmental goals, enhance their brands, and improve bottom lines.

One factor holding back progress on FLW has been limited philanthropic funding (relative to other issues in the US), which has hovered around $20 million per year.[7] The majority of that is going to food rescue efforts (adding to the nearly $300 million going to food banks across the US).[8] Philanthropy can catalyze progress through increased support to strategic efforts that will deliver measurable results in the near-, medium-, and long-term.

BY THE NUMBERS[9]

POPULATION

340M

PEOPLE WITH MODERATE OR SEVERE FOOD INSECURITY

7.8%

ANNUAL FOOD WASTE

62 **metric tons**
165 KG PER CAPITA

ANNUAL ECONOMIC COST OF FLW (USD)

$218B

TOTAL ANNUAL GREENHOUSE GAS EMISSIONS FROM FLW

239 **million metric tons of CO_2e**

SIGNATORY TO SUSTAINABLE DEVELOPMENT GOAL 12.3

YES

HIGH-IMPACT PRIORITIES

SCALE PUBLIC-PRIVATE PARTNERSHIPS NATIONALLY

Launched in 2016, the Pacific Coast Food Waste Commitment (PCFWC) is a public-private partnership bringing together food retailers and businesses, governmental actors, and nonprofit experts (including the Waste & Resources Action Programme (WRAP), WWF, and ReFED) to commit to action, then develop, test, and advance solutions that reduce FLW across the supply chain. As a first step, participants including Walmart, Kroger, Sodexo, and Aramark are now measuring and analyzing their data on FLW. Initial pilots have demonstrated significant reductions in food waste. Albertsons, a national grocery chain, is using Afresh (artificial intelligence software) to improve order accuracy and reduce waste by 15%. It is already adopting solutions nationwide and increasing revenue in the process. The concentration in the food and agriculture sectors makes scaling a nationwide public-private partnership similar to the PCFWC promising, as a number of key industry leaders are already onboard. ReFED and WWF will take the lead in launching a national effort, bringing in partners as needed. **ReFED and WWF are seeking $2 million in year one, followed by $4 million per year for two subsequent years to scale a nationwide public-private partnership.**

INFORM GOVERNMENT POLICIES AT STATE, FEDERAL, AND LOCAL LEVELS

While voluntary changes can make a significant dent in FLW, the UK experience shows that policy change is ultimately needed to approach 50% reductions. Already, nine states representing 25% of the US population have policies to restrict food waste from going to landfills and incinerators.[10] Passing similar policies in just two additional mid-sized states would bring that total to nearly one third.[11] The Zero Food Waste Coalition – a collaboration of NRDC, WWF, the Harvard Food Law & Policy Clinic, ReFED, and state-level groups – sees the need for enacting organic waste disposal bans and similar policies in the middle of the country to inspire other nearby states to do the same. The Coalition is also finding ways to educate lawmakers and shape federal policy. Municipalities also have the power to shift state-level policies, evident in the example of Baltimore's work influencing Maryland to adopt FLW policies. To do so, NRDC's Food Matters program is providing technical assistance to more than 20 city and county governments and other local actors to implement programmatic and policy changes. **The Zero Food Waste Coalition seeks $3 million over three years to shape state and federal organic waste disposal bans, agriculture policy, and other FLW-related policies. NRDC seeks $5 million over three years to advance food waste policy and programmatic efforts in U.S. cities.**

SHIFT PRACTICES AT RETAIL AND CONSUMER LEVELS

The majority of food loss and waste in the US happens at the retail and consumer levels. Consumer education that causes behavior change and cultural shift is the highest potential mitigation solution in addressing the problem. While household behavior change is ultimately needed to meet the 50% target, the cost of behavior change campaigns that target people at the household level is high and must be sustained for years (minimum $3 million per year for 5 years). Another place to start is with the restaurant industry, where 70% of waste comes from customers' plates[12] and where there is the potential to mitigate 12 million metric tons of greenhouse gas emissions (MMT CO2e) per year while engaging a smaller number of actors.[13] As part of its broader efforts, the Pacific Coast Food Waste Commitment will collaborate with researchers (such as the Menus of Change University Research Collaborative) to determine what interventions work to reduce portion sizes and show the financial viability of changed approaches, while participants of the initiative determine how to transform research findings into a national campaign. **The Pacific Coast Food Waste Commitment seeks $500,000 to conduct research on portion sizes in the restaurant industry and an estimated $4 million over two years thereafter to lead a national effort to change industry practice.**

DEEPEN IMPACT THROUGH STRATEGY AND COORDINATION

While the above represent top priorities today, continued progress requires ongoing field leadership to analyze a changing landscape, bring key players together to set priorities and strategies, and increase impact. ReFED is that field leader, enjoying respect and support from peers. ReFED's work to develop, collect, and analyze data on FLW provides a strong, data-driven basis for the targets and priorities they identify through their Insights Engine. ReFED collaborates effectively with government, private sector, and civil society sectors, building coalitions that are showing results. Using their subject matter expertise and deep knowledge of what is needed, by whom, and where, they help strengthen state and local capacity through their regranting funds. To date, they have regranted $5 million to over 40 grantees, with the first tranche catalyzing more than 13 times that amount in additional funding from other sources. They are also actively building interest in the investment opportunities available in addressing FLW through their Food Waste Funder Circle initiative that gathers and shares opportunities with interested funders. **ReFED seeks $5 million per year to double the number of food system actors engaged in FLW reduction, add new solutions and customizable tools to aid decision makers, catalyze more capital, and host strategic convenings for the sector. It seeks an additional $3 million per year for its Catalytic Grant Fund.**

INTERNATIONAL FLW NGO COUNTRY FOCUS

	The Food and Land Use Coalition	WWF	wrap	World Resources Institute	The Global FoodBanking Network
Argentina					■
Australia	■		■		■
Brazil	■	■	■	■	■
Botswana					■
Bulgaria					■
Canada			■		■
Chile		■			■
China	■	■		■	■
Colombia	■	■	■	■	■
DRC				■	■
Ecuador		■			■
Ethiopia	■			■	■
Germany		■	■		
Ghana		■			■
India	■			■	■
Indonesia	■		■	■	■
Israel					■
Jordan					■
Kenya	■	■		■	■
Malaysia		■			■
Mexico		■	■		■
Pakistan		■			
Phillippines		■			■
Rwanda				■	
South Africa		■	■		■
Switzerland		■			
Turkey					■
United Kingdom	■	■	■		■
USA		■	■	■	

APPENDIX D: RECOMMENDED READING LIST

OVERALL

- **WRI:** The Global Benefits of Reducing Food Loss and Waste, and How to Do It (April, 2023); See also Making Food Waste Socially Unacceptable: What Behavioral Science Tells Us About Shifting Social Norms to Reduce Household Food Waste (May, 2022)
- **NRDC:** Preventing Wasted Food Across the Food Supply Chain (April, 2022)
- **UNEP:** Food Waste Index Report 2021 (March, 2021)
- **World Bank:** Addressing Food Loss and Waste: A Global Problem with Local Solutions (September, 2020)
- **FAO:** The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction. (October, 2019)
- **WWF:** Drive to Waste: The Global Impact of Food Loss and Waste on Farms (August, 2021); See also WWF's Creating a Unified Approach to Measure Loss on Farms Globally featuring their Global Farm Loss Tool currently available in beta.
- **CarbonBrief:** In-depth Q&A: What food waste means for climate change (October, 2023)
- **Planet Tracker:** Financial Markets Roadmap for Transforming the Global Food System (March 2023)
- **Global Food Donation Policy Atlas:** Country-specific Legal Guides, Policy Recommendations, and Executive Summaries (2019-2023); Best Practices by Policy Area (2020-2023)

CLIMATE

- **WRAP:** Food Loss and Waste: From Commitments to Action A watching brief on Nationally Determined Contributions (November, 2022)
- **Nature Food:** Cradle-to-grave emissions from food loss and waste represent half of total greenhouse gas emissions from food systems (March, 2023)
- **Science:** Global food system emissions could preclude achieving the 1.5° and 2°C climate change targets (November, 2020)

NUTRITION

- **Champions 12.3:** SDG Target 12.3 on Food Loss and Waste: 2023 Progress Report (September, 2023)
- **FAO:** Enabling a legal environment for the prevention and reduction of food loss and waste (2022)

BY GEOGRAPHY

AFRICA:

- **WRI:** 3 Ways to Tackle Food Loss and Waste in Africa (January, 2022)

MEXICO:

- **World Bank:** Conceptual Framework for a national strategy on food loss and waste (October, 2020)

UNITED KINGDOM

- **WRAP:** Food Waste Reduction Roadmap: Progress Report 2022 (December, 2022)

UNITED STATES

- **ReFED:** Roadmap to 2030: Reducing U.S. Food Waste by 50% and the ReFED Insights Engine (February, 2021)
- **EPA:** From Farm to Kitchen: The Environmental Impacts of U.S. Food Waste (November, 2021)

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