



Report

Food waste Policy Analysis and Stakeholder

Mapping

2021

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ABSTRACT

The government of Uganda has put in place enabling policy frameworks for food loss reduction and these include the constitution of the republic of Uganda objective 12 (twelve) which compels the state to take appropriate steps to grow and store adequate food. The Uganda Vision 2040, an overarching development plan underscores the need to reduce food loss and wastage and improve food safety. The Nation Development Plan III (NDP III) provides for the establishment of food technology incubators and a national food chain management system. NDP III also prioritizes agro-industrialization with the aim of creating jobs, making households food secure, and minimizing post-harvest food loss and waste. In the Agriculture Sector Plan (2015/16-2019/20), the government allocated over UGX 450 billion (\$127 million) to interventions that would directly address food loss and waste. These included an efficient Food Agricultural Statistics (FAS) system to support policymaking, and the promotion of new food processing technologies. The Global Food Security Strategy (GFSS) Uganda Country Plan (2018) aims to address food waste at the processing stage. Under the 5th Schedule of the East African Community Customs Management Act (2004), Uganda gave tax exemptions to licensed hotels on importation of technologies, including those that relate to food waste (such as cookers, fridges and freezers, IT accessories and software). In addition, the Environment Management Act (2019) calls to control waste generation to the greatest extent possible through the circular economy, while the KCCA Strategic Plan (2020) promotes urban agriculture to increase the supply of fresh food and vegetables, and support food handlers to minimize food contamination and associated food waste and loss. Despite the effort made to put in place policy frameworks to prevent and reduce food loss and waste, food waste remains a huge challenge to the country. To overcome the challenge of food waste requires Ugandan to improve our understanding of where existing legislation is inhibiting the adoption of food prevention technologies and practice and make necessary amendments. These changes could include amending or developing new legislation to provide more flexibility or incentives to redirect food waste to charities or convert it for other purposes, avoiding its disposal in landfill. All MDAs can work together to identify and support changes to achieve national consistency. Research and development and use of technologies can improve our existing processes is an important part of avoiding and reducing food waste. Raising awareness aimed at changing our attitudes and behaviors that generate food waste. Enhance access to finance and development of business and markets to support the repurposing of food waste

1 INTRODUCTION

1.1 Background

This study is funded under the project Building Back Better; using Green and Digital Technologies to Reduce Food Waste at Consumer level. The project aims at contributing to the following Sustainable Development Goals (SDGs): SDG target 12.3 (halving food waste), SDG 2 (Zero Hunger), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Sustainable Consumption and Production), SDG 13 (Climate Action) and SDG 17 (Partnerships). It will also support countries in harnessing green and digital technologies to reduce food waste at consumer level; contribute to the attainment of the SDGs and climate goals; support countries in Building Back Better from the COVID-19 pandemic. This project brings together different knowledge groups of United Nations Environment Programme (UNEP) for an integrated approach cutting across Economic and Trade Policy, Food and Food Waste, Consumer Information, Sustainable Lifestyles, and the International Resource Panel (IRP). This is combined with case studies of 5 cities in 5 regions, including: Doha (Qatar), Bogotá (Colombia), Belgrade (Serbia), Kampala (Uganda) and Bangkok (Thailand).

1.1.1 The Objectives

The study involves;

- (i) Diagnosing the food waste problem in Kampala by working with local authorities to develop urban food waste baselines, accompanied by a survey to understand the causes and drivers of household food waste, including COVID 19-specific impacts,
- (ii) Supporting food waste measurement by applying and contributing to the UNEP-led “Food Waste Index”,
- (iii) Undertaking local policy analysis and stakeholder mapping to understand existing policies, measures and practices that have been tested or implemented to address food waste, and the wider policy framework that affects food waste indirectly,
- (iv) Understanding different enablers; Basing on the diagnosis, analyzing different enablers (technological options, economic incentives, behavioral interventions, informational tools, investment, etc.) and successful business models; proposing a tailored intervention package to address food waste issue at consumer level,

- (v) Engaging with target groups for change in policy, practices and behavior, devising strategies of engaging critical food behavior actors in Uganda.

1.2 The rationale of preventing food waste

Food waste exacerbates our triple planetary crisis, generating 8% of global greenhouse gas emissions, using finite land and water resources needlessly, adding significantly to soil and water pollution from agriculture, and negatively impacting biodiversity. One-third of the food produced for human consumption is lost or wasted, costing 2.6 trillion USD annually. Development and deployment of green technologies is key to the transition towards an Inclusive Green Economy, decoupling economic growth from resource use and tackling the planetary crisis of climate, pollution and biodiversity loss. Green technologies are increasingly being used to reduce food waste at consumer level, including in storage, packaging, pre-treatment, portion control, compost, traceability and supply-demand matching. This offers huge business opportunities for companies, including SMEs and start-ups who have been at the frontline of green innovation and sustainable value chains.

Urban food waste is primarily handled by landfilling, which leads to added expenses, energy use, and greenhouse gas emissions, particularly methane, which is released from anaerobic degradation of organic waste in landfills (Gunders 2017). Food waste management magnifies impacts from urban water and wastewater treatment and the transportation infrastructure used for waste collection and hauling. Even though urban populations globally consume 70% of food (FAO 2017), the associated ecological, health, and economic impacts are shared by the rural systems where food is produced and where waste is often disposed. Much of the urban food waste stream is not “waste,” but is actually edible food that could be used to alleviate food insecurity. Novel technologies and community interventions have been launched to “rescue” excess food in some urban areas, as demonstrated in the recent surge in electronic apps intended to connect organizations with excess food to those in need. However, there is difficulty scaling up these initiatives and overcoming the mismatch between the business needs of food donors and the nutritional needs of receiving populations. Energy and resources embedded in wasted foods can also be recovered via composting or anaerobic digestion, but there are steep economic and

technical hurdles to widespread adoption of these pathways and of the many novel food waste valorization technologies that are rapidly emerging.

1.3 Benefits of reducing food waste.

Some food manufacturers and businesses may be concerned that helping customers reduce their food waste may result in customers buying less food overall, which could result in less food sales and falling revenues. If so, then why do food retailers and manufacturers participate in food loss and waste reduction programs? First, according to studies done, store managers indicated that such programs help them extend product shelf life (for instance, through improved packaging) and reduce product losses, both in stores and along their supply chains, which results in financial benefits to the stores. Second, an econometric study indicated that a reduction in food sales at UK retailers during a 2007–12 study period did not necessarily translate into a one-to-one reduction in revenue. Rather, consumers plowed approximately 50 percent of their savings back into retail purchases, often on higher value food items (referred to as “trading up”) or on other nonfood items (WRAP 2014). Third, studies cited several nonfinancial benefits to engaging in food waste reduction programs. These included increasing employee pride, fulfilling a sense of ethical responsibility, and strengthening customer relationships. Hegnsholt et al. (2018) noted that companies that are effective at addressing societal challenges tend to be rewarded with customer loyalty. Likewise, donating surplus food to charities can strengthen a company’s brand, public reputation, and employees’ pride in where they work.

Reducing food loss and waste would lower these environmental impacts, by essentially reducing the amount of food otherwise needed to be produced to adequately feed a growing human population. This means using fewer natural resources such as water and land, applying less fertilizer, and reducing current rates of food loss and waste by 50 percent also would have significant benefits for climate, land, and biodiversity. Relative to the 2050. business-as-usual scenario identified by WRI, the World Bank, UNEP, and others in *Creating a Sustainable Food Future* (Searchinger et al. 2018), such a halving would reduce greenhouse gas emissions by 1.5 Gt CO₂ eq per year by 2050. This amount is more than recent energy and industry emissions from Japan. Such a halving also would avoid the conversion of 278 million hectares of natural ecosystems into agricultural land between 2010 and 2050. This is an area roughly the size of

Argentina. Since habitat conversion is the number one cause of biodiversity loss (Millennium Ecosystem Assessment 2005), halving food loss and waste can be a strategy for addressing the current biodiversity crisis. The EAT-Lancet Commission (Willett et al. 2019) estimates that doing so could reduce projected biodiversity losses by up to 33 percent relative to its business-as-usual scenario.

Reducing food loss and waste might play a modest role in creating jobs. For example, ReFED's Roadmap to Reduce U.S. Food Waste (ReFED 2016) estimates that, if the roadmap's 27 solutions were implemented, an additional 15,000 jobs would be created and sustained in the United States. The majority of these jobs would be created in the recycling sector, due to opening of more composting and anaerobic digestion facilities to process increased amounts of food scraps. The donation and storage sector, which includes food recovery organizations, has the next highest potential to create jobs, followed by food donation transportation. Australia's Fight Food Waste Cooperative Research Centre estimates that reducing food waste in Australia by 30 million metric tons could directly and indirectly generate up to 5,200 jobs, mostly in rural areas (Fight Food Waste CRC 2018). Start-up companies that tackle food loss and waste upstream in the food supply chain can be a source of job creation, too. For example, Protix, a company that uses food waste to feed insects, which in turn are processed into high-value protein for animal feed, now operates in 12 countries and expects to employ over 100 people by the end of 2019 (Protix 2019). Evidence is also emerging from low-income countries. For example, qualitative data from The Rockefeller Foundation's YieldWise Initiative found that a number of individuals employed by nongovernmental organization (NGO) implementers have successfully transitioned into working for companies that provide technologies and technical assistance to the smallholder farmers they previously trained and advised (Rockefeller Foundation 2019). As well as creating jobs, activities that reduce food loss and waste can also add value to food products along the value chain, which can create additional income for workers. For example, Psaltry, a cassava processing company based in Nigeria, provides locally sourced cassava products and starch for the industrial sector to create products as diverse as confectionary and building materials. The company reduces postharvest losses by strategically placing its processing facility, which employs over 300 people, close to smallholder farms. The company sources material directly from smallholder farmers, encouraging farmers to commercialize their cassava production and earning farmers additional income (Psaltry 2019). That said, the impact of reducing food loss and waste on the net number of

jobs is an under researched area. Data on job creation often does not consider how many jobs may be lost if food loss and waste were reduced. For example, if on-farm losses are substantially reduced through mechanization, less labor may be needed. More quantitative research is needed on the relationship between the reduction of food loss and waste, on the one hand, and job creation, on the other

2 POLICY ANALYSIS AND STAKEHOLDER MAPPING

2.1 Existing Policies and initiatives related to food waste

The government of Uganda has put in place enabling policy frameworks for food loss reduction and these include the constitution of the republic of Uganda objective 12 (twelve) which compels the state to take appropriate steps to grow and store adequate food, vision 2040 which underscores the need to reduce food loss and wastage and improve food safety among others”.

The Nation Development Plan III 2020/21 to 2024/25 (NDP III) provides for establishment of the National Food and Agriculture Statistics system, supports establishment of Food Technology Incubations, National Store and Relief Food Chain Management System. It also prioritizes Agro-industrialization with the aim of creating jobs making households food secure and minimizing post-harvest food loss and waste. Through the interventions below;

- Increase the proportion of households that are food secure from 60 percent to 90 percent
- Establish youth led agro processing facilities focusing on incubation and demonstration centres.
- Strengthen enforcement and adherence to product quality requirements including; food safety, social and environmental standards, grades,
- Strengthen coordination of public institutions in design and implementation of policies including access to quality food and food security
- In the human resource development component, the priority is to train and build capacity in areas of Microbiology Specialists; Food microbiologists; Agriculture Microbiology Specialists; Food Technology and Processing

Agro-Industrialization Programme 2020/21-2024/25; provides an opportunity to address the high post-harvest losses and food waste, minimize losses to disasters, stabilize prices and increase

household incomes. Among its key objectives is increase the proportion of households that are food secure from 60 percent to 90 percent, improve post-harvest handling and storage, improve agro-processing and value addition, increase the mobilization and equitable access and utilization of agricultural finance. Agro-industrialization programme plans to establish eco-friendly fully serviced agro-industrial parks/export processing zones to stimulate and expand agro-processing, empower youth to use ICT in developing agro-enterprise innovations, strengthen training and skilling centers for new skills in agroindustry, establish post-harvest handling, storage and processing infrastructure including silos, dryers, warehouses, and cold rooms of various scale and capacities at sub county, district and zonal levels and establish regional post-harvest handling, storage and value addition facilities in key strategic locations targeting (grains, meat, milk, fruits, vegetable and fish)

The Agricultural Sector Strategic Plan (2015-2020) has consistently given emphasis to strengthening research and extension services, identifying and building key human resource capacity; technology adaptation and adoption at farm level including modern irrigation technologies; up scaling the transfer and utilization of food-production and laborsaving technologies for women farmers. In the Agriculture Sector Plan 2015/16-2019/20 the government allocated over Ugx 450 billion to interventions that would directly address food losses and waste. The interventions include;

- Promote cottage processing industries through incubation of new processing technologies for both food and non-food products
- Develop and improve food handling, marketing and distribution systems and linkages to local and export markets.
- Strengthen the capacity for quality assurance, regulation and food safety standards
- Develop and adopt appropriate technologies and practices for postharvest handling along the value chain of all priority commodities
- Train food inspectors in legislation, policy, modern inspection systems and quality management systems

National Agricultural Extension Strategy 2016/17-2020/21 whose vision is Development of a competitive commercial agriculture sector by transforming it from a predominant subsistence base.

The strategy plans to; integrate post-harvest handling, and food processing into the field extension services, establish demonstrations in the Districts, promote food security, nutrition provide information on food safety and standards at household level

Uganda Food and Nutrition Policy, 2003; The overall objective of the policy is to promote the nutritional status of the people of Uganda through multi-sectoral and coordinated interventions that focus on food security, improved nutrition and increased incomes. The policy intends to;

- (i) ensure availability, accessibility, affordability of food in the quantities and qualities sufficient to satisfy the dietary needs of individuals sustainably;
- (ii) promote good nutrition of all the population;
- (iii) ensure food and income security at household, sub-county, district and national levels for improving the nutrition as well as the socio-economic status of the population;
- (iv) monitor the food and nutrition situation in the country.

Although the food and nutrition policy includes interventions to address food waste at household and food service sector little is reported on progress of such interventions. The focus is more on addressing the food loss at production stages. The Food and Nutrition Policy, 2003 has been periodically implemented through reviewing and developing of five year nutrition plans. For example, Uganda Nutrition Action Plan focused on supporting households and communities to increase access to and consumption of diversified foods throughout the year through their own food production or purchased food. Complementary programmes focused on reducing post-harvest losses and spoilage and on addressing issues related to women's workload within the household.

The Uganda Nutrition Action Plan 2011–2016 proposed a number of interventions to address food waste, they include;

- Produce and publish an annual report on the state of Uganda's food security and nutrition situation.
- Establish a food and nutrition M&E system for tracking performance of nutrition indicators and for timely decision making.
- Conduct a national food and nutrition survey to establish up-to-date nutrition baseline monitoring indicators.

- Conduct periodic district-level food and nutrition surveys in vulnerable areas and among vulnerable populations
- Support and promote urban farming to serve the most vulnerable households in urban areas
- Strengthen and scale up early warning systems on food and nutrition information from the community to the national level.
- Advocate for the enactment of by-laws and ordinances that promote nutrition and food security at district and sub-county levels
- Supporting households and communities to increase access to and consumption of diversified foods throughout the year through their own food production or purchased food. Complementary programmes will focus on reducing post-harvest losses and spoilage and on addressing issues related to women’s workload within the household.
- Promote proper food handling, hygiene, and sanitation through increased knowledge, use of safe water, and hand-washing practices at the household level.
- Promote and support local food processing and value addition at the household and community levels.
- Promote and support the utilization of safe laborsaving technologies at the household and community levels.
- Promote and support adoption of post-harvest handling and storage technologies at the household and community levels.
- Provide an enabling environment to the private sector to manufacture, market, and distribute appropriate post-harvest handling and storage technologies

Global Food Security Strategy (GFSS) Uganda Country Plan September 2018

The strategy has interventions that target to address food waste like at processing by:

- i. transformation and upgrading of agricultural commodities including commodity conditioning, agro-processing and manufacturing;
- ii. value addition and post-harvest storage and handling with actors at different levels, from the household to the medium-size trader/aggregator to larger industrial actors and

- iii. Agricultural Research and Development for Innovation: Research, product development, and commercialization of new technologies.

However, the focus of implementation of the plan has been mainly on Agricultural Inputs, which include seeds, agricultural chemicals, small equipment such as spray pumps or small irrigation kits, and larger equipment such as hullers, or tractors

Provision of tax incentives; Under the 5th Schedule of the East African Community Customs Management Act 2004, Uganda exempted tax to licensed hotels on importation of technologies including those that address food waste like cookers, fridges and freezers, kitchen ware, IT accessories and software (communication equipment. The tax exemption only applies to licensed hotels yet the food service industry is dominated by the informal sector.

Any other packing material of any kind designed for packing goods for export is exempted from all taxes under the fifth schedule of the East African Community Customs Management Act, 2004. Improved and customized packaging would reduce food waste however; the tax exemption does not apply to packaging materials for domestic products. It is limited to packaging materials designed for packing goods for export.

Cold Rooms in which a low temperature is maintained (such as for refrigeration), their import Duty is 0% in accordance with the EAC CET. This is aimed at post-harvest management and cold chain storage of agricultural products such beef, chicken, fish etc. The application of such technologies in food markets in Kampala is limited and in a few area where they are applied, they are not well maintained

Refrigerated trucks in Uganda are tax exempted and are widely used in long distance transportation of foods like milk and fish. There is little use of refrigerated trucks in the marketing and distribution of food products for example milk products are still being distributed by motor cycles commonly referred to as boda bodas.

The national grain trade policy 2015 aims at ensuring consistent quantity and quality supply of grain and grain products to the market in order to improve incomes of the sub-sector actors through efficient post-harvest handling, value addition, and effective regulation. The policy intends to

Improve and standardize grain storage facilities from 5 percent to 40 percent, reduce post-harvest losses from 37 percent to 25 percent, increase access to agro-processing facilities (cleaning, drying, and grading) from 12 percent to 50 percent. There are no publications on the progress of implementation of the national grain policy. However, initiatives have been spearheaded by the grain council to achieve the objectives of the policy. These include development of grain standards for example EAC bean standard and Post-harvest management training.

The environment management act 2019. Section 5 (2) provides for promoting circular economy by maximizing production efficiency to conserve the use of the environment and natural resources and to control the generation of waste to the greatest extent possible;

- (i) By preventing or reducing the generation of waste from production processes or products and consumption patterns;
- (ii) By promoting proper cyclical use of products in the production processes as circulative resources;
- (iii) By ensuring proper disposal of circulative resources not put into cyclical use; and
- (iv) Promoting a multi and inter-sectoral approach to environment management.

Section (77); also provide for use of circulative resources. The Authority may, by statutory instrument, require a person engaged in production processes or any other person to make use of non-hazardous circulative resources extracted from waste materials by recirculating the resources in the production process in conformity with the waste management hierarchy. Although it has a provision on circularity and application of waste management hierarchy little is being done to keep food waste in the productive cycle.

2.2 Roles key stakeholders can play to address Food waste in Uganda

Food waste along the life cycle stages results from a number of factors that broadly affect the food system, including demographic shifts that influence consumption habits, poorly coordinated policies and regulations on issues such as food safety, difficulty in accessing finances to invest in equipment that reduces food waste, a varying demand, or insufficient motivation for action, among others. Relevant interventions that can be undertaken by actors such as policymakers, financiers, intermediaries, innovators, researchers, and civil society tend to be those that address the

underlying drivers of poor infrastructure, policies and regulations, access to financing, demographic shifts, economic conditions, as well as norms and attitudes

Key stakeholders	Potential interventions
<p>Policy makers including Ministry of Works and Transport, Ministry of Trade, Industry and Cooperatives. Ministry of Water and Environment, Ministry of Local Governments, Ministry of Energy and Mineral development, Ministry of Gender Labor and Social Development, Local Government Authorities, Ministry of Agriculture Animal Industry and Fisheries Uganda National Bureau of Standards</p>	<ul style="list-style-type: none"> • Develop, facilitate, promote, and/or improve climate-smart infrastructure (e.g., roads, electricity, and community/cooperative storage) and access to informal retailers. • Implement policies to prevent unfair trading practices (e.g., blockers in food markets who tend to speculate the food prices by hoarding food). • Remove barriers to food redistribution via policies (e.g., liability limitations, tax breaks) that make it easier for food suppliers to donate safe (but unsold) food to charities or to those in need. • Support policies to standardize food date labeling practices to reduce confusion about product safety and quality, and improve consumer understanding of the meaning of date labels. • Include food waste reduction lessons in school curricula and include food waste reduction training in public procurement programs. • Provide municipal support for informal retailers to access clean water, storage areas, equipment that improves food safety, and training on how to reduce food contamination. • Make measurement and reporting of food waste by food service entities and companies' mandatory
<p>Financiers (Commercial and Development banks), Uganda Development Bank</p>	<ul style="list-style-type: none"> • Increase the number of charitable institutions funding food loss and waste prevention activities. • Create financing instruments and product lines (e.g., funds, bonds, loans) dedicated to reducing food waste.

<p>African Development Bank, Ministry Finance Planning and Economic Development</p>	<ul style="list-style-type: none"> • Increase start-up financing for new technologies and business models that would reduce waste, as well as financing to scale up proven technologies and models. • Increase development cooperation between high-income and low-income countries targeting waste. • Introduce “pay-as-you-go” programs to make technologies affordable for smaller operations (e.g., for solar powered refrigeration units and mobile processing).
<p>Researchers, Universities Research institutions (Makerere University - College of Food Science and Technology Center for Research in Energy and Energy Conservation (CREEC) Kyambogo University Uganda Industrial Research Institute</p>	<ul style="list-style-type: none"> • Research new and innovative technologies to preserve food quality and extend shelf life. • Develop innovative products from perishable food commodities, such as fruits and vegetables, to promote whole food utilization. • Undertake research to fill data gaps and standardize reporting of food loss and waste data in order to better compare results, create benchmarks, and provide clearer direction for stakeholders. • Assess impact of interventions to improve evidence base of what works and the return on investment. • Develop sector-specific guidance that provides the motivation and technical information for businesses to take action (e.g., promote industry roadmaps for food loss and waste reduction) • Develop and improve availability of processing and preservation facilities (including aggregation centers and mobile low-carbon options). • Develop alternative outlets during peak season through organizing opportunities to markets with other seasonality’s.

	<ul style="list-style-type: none"> • For unmarketable crops, improve flow of information to find alternative buyers.
NGO, Civil society organization and Sector Association (Uganda Hotel Owners Association)	<ul style="list-style-type: none"> • Raise awareness and shift social norms so that food waste is considered “unacceptable” for all, including higher-income consumers. • Encourage public and private sector leaders to pursue the Target-Measure-Act strategy on food waste. • Act as a channel for the sharing and reporting of food waste data and progress.

3 PROPOSED INTERVENTION TO REDUCE FOOD WASTE AT RETAIL STAGE

Food waste during wholesale and retail can result from factors including poor handling, not storing or transporting products at the right temperatures, equipment malfunctions, overstocking due to an inadequate assessment of supply and demand (or fear of empty shelves), and disposing of unsold food, among others. Relevant interventions tend to be those that address the underlying drivers of inadequate skills and knowledge, poor supply and demand forecasting, suboptimal packaging, inadequate equipment, concerns about possible risks, inflexible procurement requirements, and marketing strategies.

Key stakeholders	Potential interventions
Retailers and wholesalers (formal)	<ul style="list-style-type: none"> • Expand cold storage systems during wholesale and logistics to protect products vulnerable to heat damage. • Find food rescue partners or establish online marketplaces that facilitate sale or donation of rejected shipments or short-life products. • Use backhauling (or other logistics solutions) to enable return of reusable storage containers or rescue of surplus food for people in need. • Invest in technologies to track temperature and ensure freshness, streamline routing, track movement

	<p>of goods in and out of warehouses, and monitor food loss and waste.</p> <ul style="list-style-type: none"> • Improve training of staff in temperature management, product handling, and stock rotation. • Optimize inventory management systems (and increase flexibility in supplier contracts) to better match forecasting and ordering • Enable consumers to purchase smaller or customized portions (e.g., through bulk bins or staffed seafood and meat counters). • Adjust promotions to avoid excessive purchase of additional items (e.g., offer half off or mix-and-match deals rather than two-for-one offers). • Redesign in-store merchandising to avoid excessive handling of products by consumers (e.g., sort by stage of maturity), and to achieve the desired appearance of abundance but with less damage and excess product (e.g., through smaller bins and bowls). • Educate consumers about better food management (e.g., proper storage, meal planning, understanding date labels, safe food handling, and cooking tips). • Adjust pricing and promotion strategies (e.g., quantity discounts) to avoid lower prices leading to over purchasing.
Retailers informal	<ul style="list-style-type: none"> • Participate in groups or associations of informal operators to access guidance and training in best practices in food handling and storage. • Take advantage of municipal support to access clean water, storage areas, equipment that improves food

	<p>safety, and training on how to reduce food contamination.</p> <ul style="list-style-type: none"> • Use practices that minimize damages such as handling produce gently, stacking properly (e.g., to avoid bruising delicate produce), marking cases to track inventory, and rotating stock following a “first-in-first-out” method. • Ensure that displays allow air to be circulated and temperature conditions to be appropriate for product to remain fresh (e.g., high-ethylene producers should be kept away from ethylene-sensitive commodities). • Avoid sprinkling unclean water on products (to minimize wilting and shriveling) as such practices result in unsafe foods shunned by buyers. • Improve packaging design and materials to reduce risk of damage or spoilage, and to keep food fresher for longer while balancing other ecological considerations related to packaging.
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4 PROPOSED INTERVENTIONS TO PREVENT WASTE AT CONSUMER LEVEL

Consumption Food loss and waste during consumption, whether from a company’s or consumer’s perspective, can result from inaccurately planning what will be consumed, portion sizes that are too large, mistakes during preparation, fears related to food safety, and improper handling and storage, among other factors. Relevant interventions tend to be those that address the underlying drivers of inadequate implementation of practices, inadequate skills and knowledge, cultural norms and attitudes, concerns about possible risks, lack of awareness, suboptimal packaging, and marketing strategies

Stakeholder	Food prevention measures
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Households	<ul style="list-style-type: none">• Buy only what you expect to eat: check refrigerator and cupboards before shopping, use a shopping list, and plan meals in advance.• Know the difference between “use by” (which is about food safety) and “best before” (which is about quality and still safe to eat after this date).• Freeze or preserve food before it spoils, and find out how to best store different foods so they stay fresh and safe longer.• Find creative ways to use leftover ingredients and products past their peak quality (e.g., in soups, sauces, smoothies), as well as to cook the parts you may not normally eat (e.g., stems, cores).• Organize the kitchen and refrigerator so that items do not get lost and spoil.
Restaurants	<ul style="list-style-type: none">• Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, reward staff who deliver against targets).• Shift away from preparation methods such as batch cooking, casserole trays, and buffets to reduce overproduction and repurpose excess food (e.g., offer customers “doggy bags,” safely

	<p>incorporate unused items into other dishes, sell excess food at a discount, donate unsold food).</p> <ul style="list-style-type: none"> • Revisit inventory management and purchasing practices (as well as menus) to better fit needs based on historical trends and waste data. • Use scales in the kitchen to weigh food and track items most commonly wasted (and estimate the financial cost of food disposed, thus creating a financial signal to waste less). • Consider whether portions served exceed what can be eaten, and rethink promotions that encourage over purchasing by customers
Hotels	<ul style="list-style-type: none"> • Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets). • Rethink the buffet (e.g., shift certain items to à la carte near end of meal times, reduce the size of dishes used in buffets). • Reduce overproduction by producing smaller quantities of items consistently left on the plate.

	<ul style="list-style-type: none">• Repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it).• Communicate to guests about food waste and encourage them to take only as much as they need.
Catering/food service	<ul style="list-style-type: none">• Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets).• Reduce the amount overproduced (e.g., by producing smaller quantities of items that are consistently under consumed).• Repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it).• Use scales in the kitchen to weigh food and track items most commonly wasted (and estimate the financial cost of food disposed, thus creating a financial signal to waste less).• Evaluate contractual obligations between clients and suppliers that generate waste and overproduction (e.g., contracts that stipulate that all hot dishes must be available for the full-service period)

<p>Public and private institutions (e.g., schools, hospitals, government canteens)</p>	<ul style="list-style-type: none">• Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets).• Reduce the amount overproduced (e.g., by producing smaller quantities of items that are consistently under consumed), and repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it).• Introduce techniques to minimize people taking overly large portions (e.g., tray less dining, flexible portion sizes, pay-by-weight pricing system, smaller plates).• Revisit inventory management and procurement practices (as well as menus) to better fit needs based on historical trends and waste data.• Use scales in the kitchen to weigh food and track items most commonly wasted (and estimate the financial cost of food disposed, thus creating a financial signal to waste less).
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5 POLICY RECOMMENDATIONS FOR FOOD WASTE PREVENTION

1. Promote adoption of storage solutions focused on collaboration among storage providers, cold chain players, financiers, and government to get income-sensitive, climate-smart storage technologies into the hands of traders, food services and distribution enterprises in Uganda.
2. Promote or advocate for change in social norms, behavior and practice. Leverage the latest findings of behavioral science, engage grassroots campaigns, social media, religious communities, and others to make “wasting food” unacceptable
3. Develop appropriate financing mechanisms dedicated to promoting investment in enterprises, technologies, and programs designed to reduce food loss and waste. These financing mechanisms should provide special consideration for the informal sector.
4. Overcome the data deficit by investing in data collection and storage infrastructure to eliminate challenges associated with absence of or unreliable data on food waste
5. Promote research on green technologies and innovations for reducing food waste.
6. Use ICT to gather better data on retailer to predict consumer demand preferences and behavior
7. Encourage use storage containers that protect against variations in temperature and precipitation. For the government can provide incentives to expand cold storage systems during wholesale and logistics to protect products vulnerable to heat damage.
8. Promote use of available packaging solutions in the informal and formal retailers and encourage packaging adjustments for smaller scale buyers
9. Support population in gaining relevant skills that avoid food waste (e.g., incorporate in education curriculum lessons in food preparation and planning
10. Introduce tax incentives for donating unsold but still safe food to food rescue organizations.
11. Amend laws and establish standards to allow unsold food to be either redistributed to food poor communities or used in animal feed.
12. Develop policies that help small businesses improve their operations (e.g., by incentivizing and providing support for food handling practices that reduce contamination).
13. Conduct benefit-cost analyses of food waste reduction programs to discern the financial return on investment (relevant for farmers, companies, government agencies, households).
14. Launch communications campaign about the financial returns of waste reduction efforts.

15. Together with the community and relevant actors in the supply chain, create or expand financially viable markets (e.g., secondary surplus markets, donation, value-added processing) for products that would otherwise be wasted.
16. Create funds (and associated project preparation facilities) dedicated to reducing waste.
17. Introduce financial product lines in commercial and development banks focused on food waste reduction technologies and programs.
18. Introduce “pay-as-you-go” programs to make technologies marketed to largescale commercial operations affordable for smallholder operations (e.g., for solar powered refrigeration units)