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FOOD LOSS AND WASTE VALUE CHAIN SELECTION GUIDE

September 2020

This publication is made possible by the support of the American People through the United States Agency for International Development (USAID) and the United States Department of Agriculture (USDA). The contents of this guide are the sole responsibility of Agribusiness Associates Inc. and do not necessarily reflect the views of USAID or the United States Government.

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Acknowledgements

The development of the Food Loss and Waste Value Chain Selection Guide was part of the International Food Loss and Waste Hotspots and Business Models Project, funded by the United States Agency for International Development (USAID) and implemented by Agribusiness Associates Inc. with technical support from the United States Department of Agriculture (USDA).

This guide is based on the experience of development practitioners working in reducing food loss and waste in value chain development work, with support from USAID and USDA, in different regions.

Many thanks to those who provided invaluable support in the development of the guide: Ana Torres, Caitlin Corner-Dolloff, Noel Gurwick, Gurbinder Gill, Lisa Kitinoja, Mandeep Sharma, and Paige Cowie.

The review efforts and technical contribution of experts are gratefully acknowledged: Hala Chahine Tsouvalakis, Heike Axmann, Kai Robertson, Leigh Prezkop, Nicole Tanner, and Tanya Stathers.

INTRODUCTION AND OBJECTIVE

Over one-third of the food produced globally is lost or wasted. Food production is resource intensive and when food is lost or wasted, it also entails the loss of resources that have been invested, including land, water, labor, and energy. With rising populations, increasing demand for food, and greater pressures on our natural resources, reducing food loss and waste (FLW) is one of the most impactful ways to increase the food supply and the resilience of the food system. Reducing FLW can help meet the UN Sustainable Development Goals by 2030 and is key to reducing greenhouse gas emissions (GHG) and keeping climate change in check.

Agricultural value chain development work typically starts with an assessment of different value chains to determine which ones the project should focus on to have the greatest impact. Value Chain selection criteria commonly used by USAID funded projects include competitiveness potential, impact potential, cross-cutting issues, industry leadership, resilience, and implementation feasibility. Given the scale of the Food Loss and Waste problem and the potential to bring about change including greater economic, nutritional, and environmental outcomes, it is important to integrate Food Loss and Waste related considerations into the value chain selection process.

OBJECTIVES

This guide is a practical resource developed to educate stakeholders on how to integrate Food Loss and Waste reduction into agricultural value chain selection. It provides guidance on several FLW criteria including food loss, food waste, economic outcomes, food security and nutrition, climate vulnerability, carbon footprint, water footprint, land footprint, wildlife and biodiversity, gender, youth and socially excluded and marginalized communities, and FLW investment opportunity. The guide provides guiding questions and suggested indicators, that program designers and implementers can use to select crops according to their FLW goals.

USER GUIDANCE

AUDIENCE

- This guide has been developed for Program Designers and Implementers who are interested in integrating Food Loss and Waste principles into value chain development starting with value chain selection.
- The concepts presented in this guide can be easily incorporated into your organization's value chain selection methodology.

HUMAN RESOURCES NEEDED

- Team Lead
- External consultant (may be hired for value chain selection and FLW expertise and to complete the process in a short timeframe)
- Key project staff including agricultural value chain development specialist, FLW Specialist, and Monitoring & Evaluation specialist
- External stakeholders may be engaged at different stages of the selection process: project counterparts, target beneficiaries, government officials, private sector and value chain actors

TIME

The time taken for the selection process may range from 1 month to several months depending on various factors including:

- Size of the project (funding, number of beneficiaries, and geographies to be reached)
- Availability of secondary data
- Time spent collecting primary data
- Number of stakeholders consulted
- Number of years of the project
- Number of crops that are evaluated and number to be selected

PROCESS FOR FOOD LOSS AND WASTE VALUE CHAIN SELECTION

The main steps involved in FLW value chain selection are:



STEP 1: FRAME YOUR FLW OBJECTIVE

The following questions are provided to help with framing and scoping the FLW objectives. These can be answered in a workshop with project staff and counterparts.

Frame and Scope the FLW Objective Workshop Questions

- 1) What is the problem you are trying to solve?
- 2) Take a stab at framing it as a FLW objective.
- 3) State the ultimate impact that the project has.
- 4) What are the impact indicators, government policies, donor requirements?
- 5) What are some possible solutions to the problem?
- 6) Write down some of the context and constraints that the project is facing
- 7) Does the original FLW question need a tweak? Try it again.

Human resources: project staff and counterparts

STEP 2: SHORTLIST PROMISING VALUE CHAINS

Build your shortlist of value chains using the following steps:

- Make a list of crops commonly grown in the area. Check with different stakeholders on the crops they are working on in the selected area
- Think out of the box and consider new or lesser known value chains
- Briefly engage with farmers, market actors, and consumers to understand crops that are in high demand
- Consider any inclusion or exclusion criteria as per the project’s goals.
- Group crops by categories such as staple, fruits, vegetables, tubers, oilseeds, herbs and spices, dairy and livestock, etc.

Human Resources: Project staff, counterparts, target beneficiaries, and key stakeholders

STEP 3: CHOOSE PRIORITIZATION CRITERIA

The prioritization criteria can be selected and developed into a prioritization matrix which can be helpful to compare the short-listed value chains. To develop the matrix, select key criteria and indicators from the list of criteria provided in the next chapter on Food Loss and Waste Criteria. The selection of criteria and indicators should be done in alignment with the FLW objectives of the project and the availability of data. See Figure 1, for an example of a value chain selection matrix.

A comparison can be done by using ranking or scoring strategies. Different indicators can have different weights based on the Project team’s consensus. Using the prioritization matrix, the list of crops can be more deeply investigated.

Figure 1: Illustrative Template for a Value Chain Selection Matrix

Criteria	Food loss	Food waste	Economic Value Lost	Nutrition	Carbon footprint	Land Footprint	Biodiversity & Wildlife	Potential to ↑ gender equality	Potential to ↑ youth employment	Investment Opportunities	Total
Indicator	Food loss %	Food Waste %	Economic Value of FLW \$\$	Calories	Greenhouse gas emissions	Surface area equivalent for FLW	Incidents of wildlife coming to human settlements for food	Rate potential to ↑ women’s jobs & businesses	Rate potential to ↑ youth jobs & businesses	Rate the suite of solutions’ ability to decrease FLW and investment needed	
Weight	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	100%
Crop A											
Crop B											
Crop C											

Adding FLW to your organization’s value chain selection methodology: The criteria presented in this guide are specific to FLW. If your organization, already has a value chain selection methodology with commonly used criteria (e.g. competitiveness potential, impact on target group, cross-cutting issues, industry leadership, resilience, and implementation feasibility), it is recommended that selected FLW criteria be included in the existing methodology to reduce research burden and facilitate faster decision making. When selecting FLW criteria avoid overlap or duplication with existing criteria. If the organization’s value chain selection methodology is not flexible, then the FLW value chain selection exercise can be added as an activity under the overall value chain selection exercise.

Human resources: Team leader along with project staff

STEP 4: QUALITATIVE AND QUANTITATIVE DATA COLLECTION

Based on the Prioritization matrix conduct a desk study to obtain secondary data on Food Loss and Waste for the value chains under consideration. Key steps for the data collection process are:

- Look at Food Loss and Waste Assessments (may often be called Postharvest Assessments) as well as value chain studies, national statistics, government websites, etc.
- Conduct field investigation to speak with farmers, traders, agribusinesses, and other value chain actor innovators, government, and other key stakeholders
- According to the list of criteria, prepare a question guide and number of respondents needed
- Information collected should be compiled into a short report/presentation that can be presented at the validation workshop

Human Resources: Project team, local experts, and field staff

STEP 5: VALIDATION WORKSHOP

A validation workshop should be organized with project staff and field staff, project counterparts, stakeholders including beneficiary representatives, value chain actors, private sector, government representatives, service providers, and business associations. Note that consulting different stakeholders is a time taking process and only those stakeholders should be invited, who are relevant for buy-in and decision-making.

The workshop should be used to share findings from data collection for all crops and geographies that were considered. The stakeholders can help fill any gaps in data and understanding through their field experience and group discussion.

If the project team has finalized the value chain selection, these can be presented to the stakeholders for their buy in. If the project team has not finalized the value chain selection, the ranking exercise using the prioritization matrix can be revisited to finalize the selection. After the validation workshop, the team leader should write the final report and disseminate findings to key stakeholders.

Human Resources: Project staff and field staff for organizing the workshop

OVERALL CONSIDERATIONS

1. This guide can be used in addition to the prevailing method in which your organization currently does value chain selection. Choose criteria and indicators in a way to avoid duplication
2. The guide provides a process that can be adjusted to the needs and context of the project
3. Comparing value chains based on hard data may not be possible as practitioners may often find that quantitative data for Food Loss and Waste is lacking for the crops and geographies under consideration. Qualitative discussion questions have been provided to help project designers ask the right questions to gather field knowledge and fill the gaps in FLW understanding.

FOOD LOSS AND WASTE CRITERIA

The following table provides FLW criteria, guiding questions, suggested indicators, and sources of data. Users may choose questions and indicators based on project goals as well as data availability and the time and resources available to collect primary data. This table provides the key information for use during the development of the prioritization matrix as well as during the qualitative and quantitative data collection on each value chain.

CRITERIA	GUIDING QUESTIONS	SUGGESTED INDICATORS	SOURCES OF DATA
Food Loss	<ul style="list-style-type: none"> • How perishable is the food? <ul style="list-style-type: none"> ○ Rate as Low, Medium, High ○ Estimate number of days it is shelf-stable before it starts going bad ○ Is the crop grown for fresh or processed market? • Where in the chain do most of the loss occur? Critical loss points may include On-farm loss, Storage, Transport, Processing and packaging (or lack of), Wholesale, and Retail. Look for food loss data by stage in the value chain • What are the main causes of loss? May include unsuitable harvest timing, harsh climatic conditions, harvest and handling practices, infrastructure and marketing challenges • Are there any types of actors and/or conditions that particularly drive loss? • Where does the food loss go? Is it re-purposed? 	<ul style="list-style-type: none"> • Food Loss % (also referred to as Post-harvest Loss - loss that occurs along the food supply chain from harvest/slaughter/catch up to, but not including, the retail level) • Formula for Food Loss %: Percentage of physical quantity loss divided by the amount produced 	<ul style="list-style-type: none"> • FAO's Food Loss and Waste Database • APHLIS provides postharvest loss and value chain stage breakdown of loss for grains in sub-Saharan African countries • Food Loss assessment reports for the crop by focus country and region
Food Waste	<ul style="list-style-type: none"> • What are the main causes of waste? Examples include poor purchase planning, excess and impulse buying, confusion over labels ("best before" and "use by"), 	<ul style="list-style-type: none"> • Food Waste % (waste that occurs at the retail and consumption level) • Formula of Food Waste %: Percentage of food waste divided by 	<ul style="list-style-type: none"> • Food Waste assessment reports for the

CRITERIA	GUIDING QUESTIONS	SUGGESTED INDICATORS	SOURCES OF DATA
	<p>consumer expectation of perfect-looking food, poor in-home storing or stock management, preparing too much food, lack of knowledge on how to use leftovers in recipes, time management, accounting for family tastes, food safety concerns, portion and pack size, etc.</p> <ul style="list-style-type: none"> • Is the food shelf-stable or perishable? • Are there any types of actors and/or conditions that particularly drive waste? (Examples may include Tourist hotels, retailers, etc.) • Where does the food waste go? Is it re-purposed? Answers may include trash/landfill, compost, burned, re-purposed for other food or non-food uses, etc. 	<p>amount available for human consumption.</p>	<p>crop by focus country and region</p> <ul style="list-style-type: none"> • If data is not available for the particular geography, use regional figures from Food Wastage Footprint: Impact's on Natural Resources • For US data, see USDA and EPA data
Economic Outcomes	<ul style="list-style-type: none"> • What is the price of the crop? Is it Low, Medium, or High Value? • How important is this crop to the national economy? (eg. production, import/export, etc.) • Does damage/loss in quality, adversely affect the price of the crop to a large extent? What is the percentage of price reduction? How much of the crop is damaged at retail sale? • Is there unmet seasonal demand which could be met through processing or storage? Is there a market for value-added products? Is there infrastructure for value-added processing? 	<ul style="list-style-type: none"> • Value of Food Loss (annual production * average price * % of food loss) • Value of Food Wasted (annual production * average price * % of food wasted) 	<ul style="list-style-type: none"> • Annual production from national statistics • Average price from national statistics and value chain analysis reports • Food loss % from FAO's Food Loss and Waste Database and reports • Food Waste % from Food

CRITERIA	GUIDING QUESTIONS	SUGGESTED INDICATORS	SOURCES OF DATA
Food Security and Nutrition	<ul style="list-style-type: none"> • Is this an important crop for food security? • Is this an important crop for nutrition? • Will reduction in FLW upstream lead to improved food security and nutrition for food-insecure groups esp. farming communities? • Will reduction in FLW downstream lead to improved consumer access to food? • Can food be processed/stored for consumption in the low season? Is this currently being done? • For high-income countries: Are there opportunities for food recovery and redistribution to increase access to food and improve diets of food-insecure individuals? 	<ul style="list-style-type: none"> • Nutritional values including Calories/energy, protein, carbohydrates, and key nutrients such as Vitamin A, Calcium, Zinc, etc. • Food Security Indicator: Rate the extent to which intervention in this value chain will increase food availability and access by rural and urban poor? 	<p><u>Wastage Footprint: Impact's on Natural Resources</u> and reports</p> <ul style="list-style-type: none"> • <u>APHLIS</u> provides data on the financial impact of food loss for grains in sub-Saharan African countries <hr/> <ul style="list-style-type: none"> • Use FLW Protocol <u>FReSH Food Loss and Waste Value Calculator</u> to calculate nutritional values • <u>Food Systems Dashboard</u> provides country-level information on nutrition, food systems, and consumer behavior • <u>APHLIS</u> provides data on the nutritional impact of food loss for grains in sub-Saharan African countries

CRITERIA	GUIDING QUESTIONS	SUGGESTED INDICATORS	SOURCES OF DATA
Climate Vulnerability	<ul style="list-style-type: none"> • What is the impact of extreme weather events or changing weather patterns (e.g. extended period of hot days, change in seasons like delayed rain and delayed harvests, etc.) on FLW for this VC? Examples may include extended heat waves contribute to increased decay during transportation, changing seasons cause the harvest to be ready later than usual and there is a rush to harvest before winter sets in, inability to harvest because of weather events leading to on-field loss, inability to send produce from the farm on time because of weather event, etc. • What is the impact of the VC's food loss and waste on the climate? 	<ul style="list-style-type: none"> • Rate level of vulnerability of the crop to climate change as relating to FLW • Rate the extent to which FLW intervention in this VC will reduce the impact of climate shocks? • Availability of improved technologies with proven resistance to climate-related constraints 	<ul style="list-style-type: none"> • Research reports • Project's assessment of context and value chain
Carbon Footprint	<ul style="list-style-type: none"> • How much GHG emissions is resulting from FLW in this VC? (low, medium, high) • Where in the VC do most of the GHG emissions take place? Is it upstream and related to primary production? Is it downstream and related to the accumulation of GHG emissions throughout the value chain? 	<ul style="list-style-type: none"> • GHG emissions (total amount of GHG resulting from FLW that is emitted throughout the food's life cycle, expressed in carbon dioxide (CO₂) equivalent) • GHG emitted per unit of food consumed 	<ul style="list-style-type: none"> • FLW Protocol's FReSH Food Loss and Waste Value Calculator • FAOSTAT data on Shares of Emissions from Agriculture by country (not disaggregated by crop)
Water Footprint	<ul style="list-style-type: none"> • What is the FLW impact on water resources (consumption, pollution, quality)? • Is water used efficiently in the value chain? How is water use linked to FLW? (e.g. 	<ul style="list-style-type: none"> • Water Scarcity footprint: a measure of all the freshwater relating to FLW, used to produce and supply that product to its final consumer, at all 	<ul style="list-style-type: none"> • FLW Protocol's FReSH Food Loss and Waste Value Calculator

CRITERIA	GUIDING QUESTIONS	SUGGESTED INDICATORS	SOURCES OF DATA
	incorrect watering can lead to more pest burden leading to greater FLW)	stages of the supply chain (includes blue, green, and grey water)	<ul style="list-style-type: none"> • Mekonnen and Hoekstra, 2014 for water footprints of different staple crops • Water consumption and Water pollution
Land Footprint	<ul style="list-style-type: none"> • What is the impact of FLW on land? • Is this VC driving more land-use change? Is it driving deforestation? • For this value chain, is the GHG emissions particularly related to the land footprint? 	<ul style="list-style-type: none"> • Land footprint: the surface of land needed to produce the food (including for meat and dairy production) that is lost or wasted • Emissions from Land Use • Soil quality index 	<ul style="list-style-type: none"> • FAO Land Use • Agriculture and Land Use National Greenhouse Gas Inventory • USDA Land Use • Soil Index: FLW Protocol's FReSH Food Loss and Waste Value Calculator
Biodiversity and Wildlife	<ul style="list-style-type: none"> • What is the VC's impact on biodiversity and wildlife? • Is this VC expanding in areas close to protected ecosystems? • Is the FLW being discarded in a way that is attracting terrestrial and aquatic wildlife? (e.g. primates and elephants coming to human settlements to eat through the trash) 	<p>Select indicators according to the main impact of FLW on biodiversity and wildlife. Examples:</p> <ul style="list-style-type: none"> • Endangerment of different species • Incidents of wildlife coming to human settlements for food • Wildlife corridors being interrupted by new farms 	<ul style="list-style-type: none"> • Conservation reports
Gender, Youth and Minority Groups (including	<ul style="list-style-type: none"> • Where are the women, youth, and minority groups (including socially marginalized people, indigenous people, and people with disabilities) in this value chain and what do 	<ul style="list-style-type: none"> • Number of women, youth, minority group people employed in the VC • Number of women, youth, and minority business owners in the VC 	<ul style="list-style-type: none"> • Government statistics • Reports

CRITERIA	GUIDING QUESTIONS	SUGGESTED INDICATORS	SOURCES OF DATA
Socially Marginalized People, Indigenous People and People with Disabilities)	<p>they do? Consider any other groups that do not have equitable participation in this value chain.</p> <ul style="list-style-type: none"> • Can FLW interventions increase their participation, employment, and entrepreneurship in the value chain? Where? • What are the barriers to entry? How can they be overcome? 	<ul style="list-style-type: none"> • Potential of VC to contribute to increased women, youth, and minority empowerment and equality through FLW related employment or entrepreneurship opportunities 	<ul style="list-style-type: none"> • Project's assessment
FLW Investment Opportunity	<ul style="list-style-type: none"> • Do impactful FLW solutions exist for this VC? Are these solutions tested and validated? Are these solutions accessible for smallholder farmers and other upstream actors or will they need huge investments? • Can entrepreneurship be encouraged for scaling out FLW technologies? • Is the Investment climate conducive for FLW investments? • What FLW capacity and infrastructure is already in place? What are the current and planned public and private sector investments? • What is the VC's potential for products/services/innovations that compensate for GHG emissions? 	<ul style="list-style-type: none"> • Rate the suite of solution's ability to be scalable and profitable • Rate the suite of solutions' ability to decrease food loss or waste and investment needed • Rate the solutions' ability to increase the food available for consumption vs. being sent to a non-food destination (e.g. animal feed, bio-based material processing, anaerobic digestion, composting, land application, landfill, etc.). More information on valorizing waste by destination is provided in the Food Loss and Waste protocol. • Rate availability or interest in financing investments the VC 	<ul style="list-style-type: none"> • Reports • Project's assessment

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