OVERVIEW OF GLOBAL FOOD LOSS + WASTE PROTOCOL

Kai Robertson

Lead Advisor, World Resource Institute

CANADA'S 2017
FOOD LOSS + WASTE FORUM
Finding Solutions

Food Loss + Waste PROTOCOL

Provision Coalition

Canada's 2017 Food Loss + Waste Forum

April 12, 2017

By Kai Robertson
Lead Advisor, FLW Protocol, World Resources Institute

The Food Loss & Waste Opportunity

FURTHER WITH FOOD
Center for Food Loss and Waste Solutions

Understand the Issue

What Is Food Loss and Waste?

Why Does It Matter?

How Much Is There?

What Can We Do About It?

FURTHER WITH FOOD
Center for Food Loss and Waste Solutions

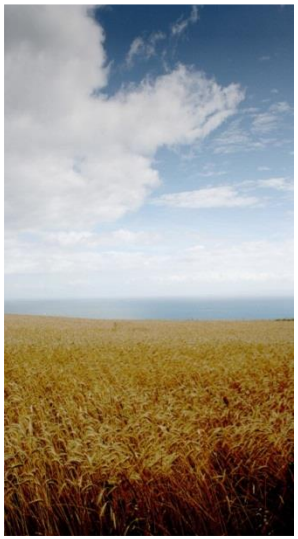
What Is Food Loss and Waste

Food loss and waste (FLW) refers to food that is **not** eaten by people, for whatever reason.

Some definitions and estimates also include inedible parts, such as bones, rinds and pits.

Food is Lost or Wasted Along the Entire Value Chain

Production	Handling and Storage	Processing and Packaging	Distribution and Market	Consumption
During or immediately after harvesting on the farm	After product leaves the farm for handling, storage, and transport	During industrial or domestic processing and/or packaging	During distribution to markets, including losses at wholesale and retail markets	Losses in the home or business of the consumer, including restaurants and caterers



Source: WRI analysis based on FAO. 2011. *Global food losses and food waste – extent, causes and prevention.* Rome: UN FAO.

WORLD RESOURCES INSTITUTE

FURTHER WITH FOOD
Center for Food Loss and Waste Solutions

Why Does It Matter?

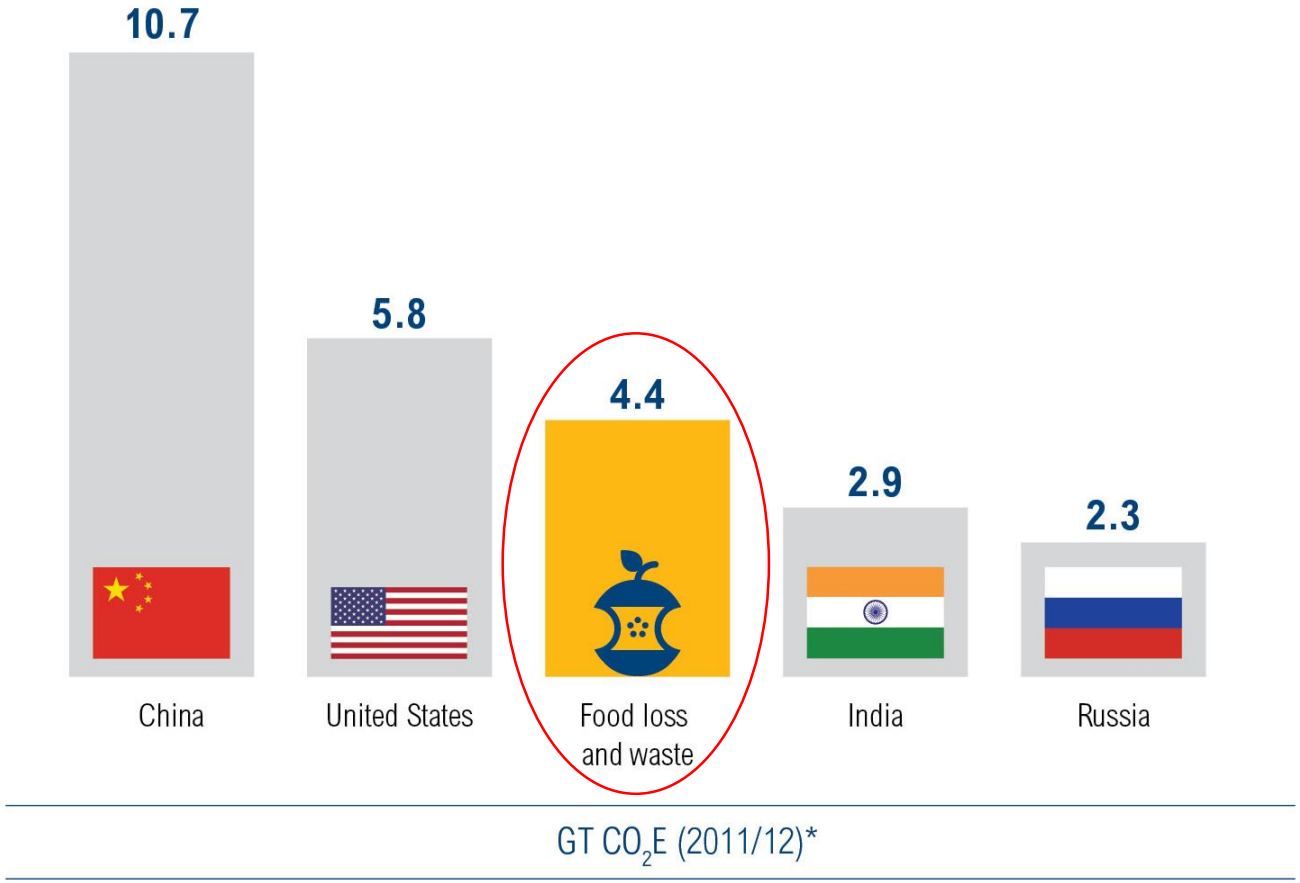
Reducing food loss and waste (FLW) is an opportunity with social, economic, and environmental benefits:

- ✓ Improve food security for a growing population
- ✓ Feed hungry people now

- ✓ Increase efficiency and avoid unnecessary costs
- ✓ Improve nutrition and save consumers money

- ✓ Conserve and protect natural resources
- ✓ Contribute to reducing climate change

If Food Loss and Waste Were its Own Country, it Would Be the Third Largest Greenhouse Gas Emitter



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

Source: CAIT. 2015; FAO. 2015. *Food wastage footprint & climate change.* Rome: FAO.

WORLD RESOURCES INSTITUTE

UNEP

FURTHER WITH FOOD
Center for Food Loss and Waste Solutions

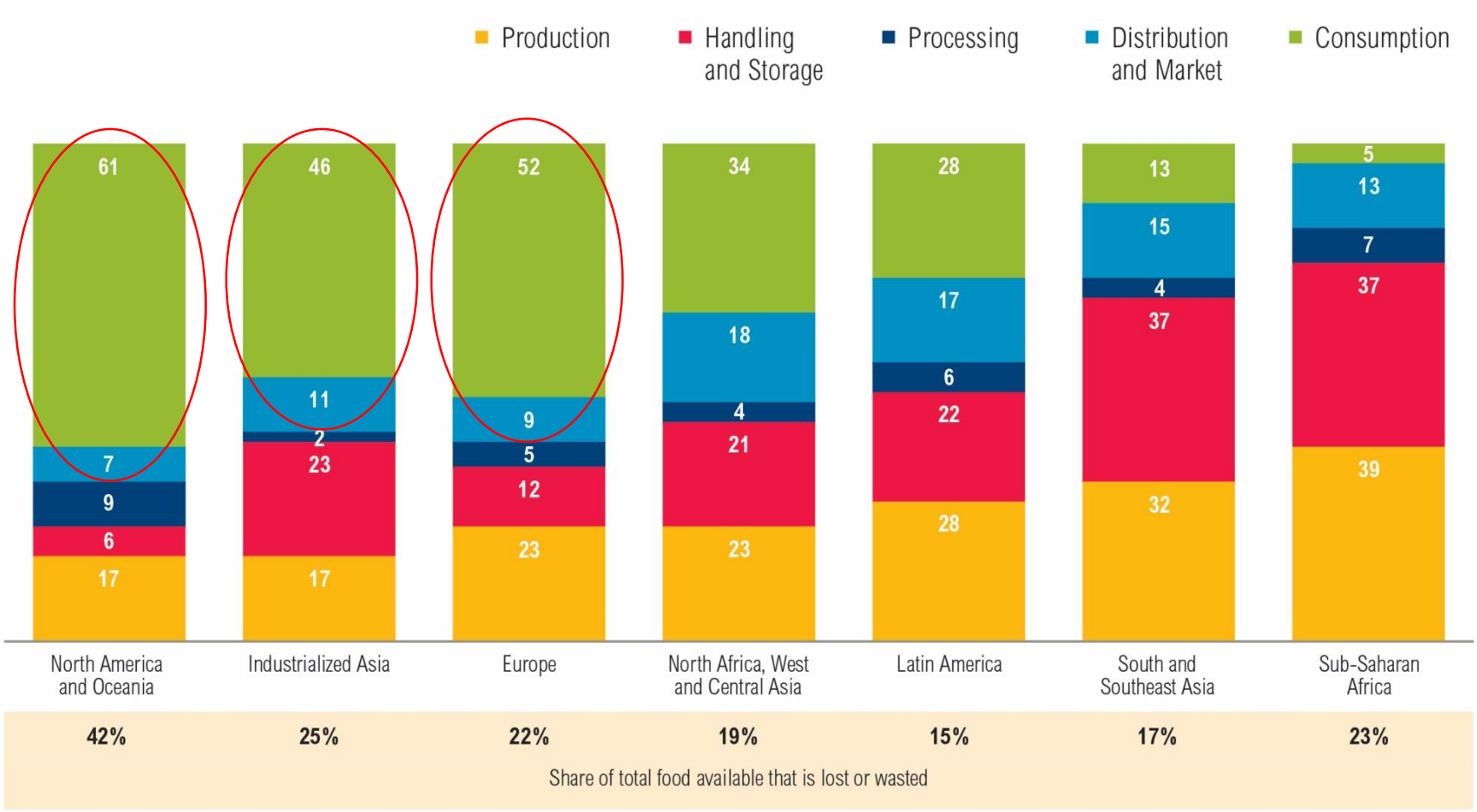
How Much Is There?

- No single comprehensive estimate of food loss and waste (FLW) in the U.S.

- Estimates vary depending on factors that include:
  - ✓ Whether inedible parts, such as bones, rinds and pits, are included
  - ✓ Which destinations, such as animal feed and composting, are included
  - ✓ Which primary data sets and methods are used

LEARN MORE ABOUT THESE ESTIMATES
@ www.furtherwithfood.org

How Food Loss and Waste is Distributed Around the World Varies



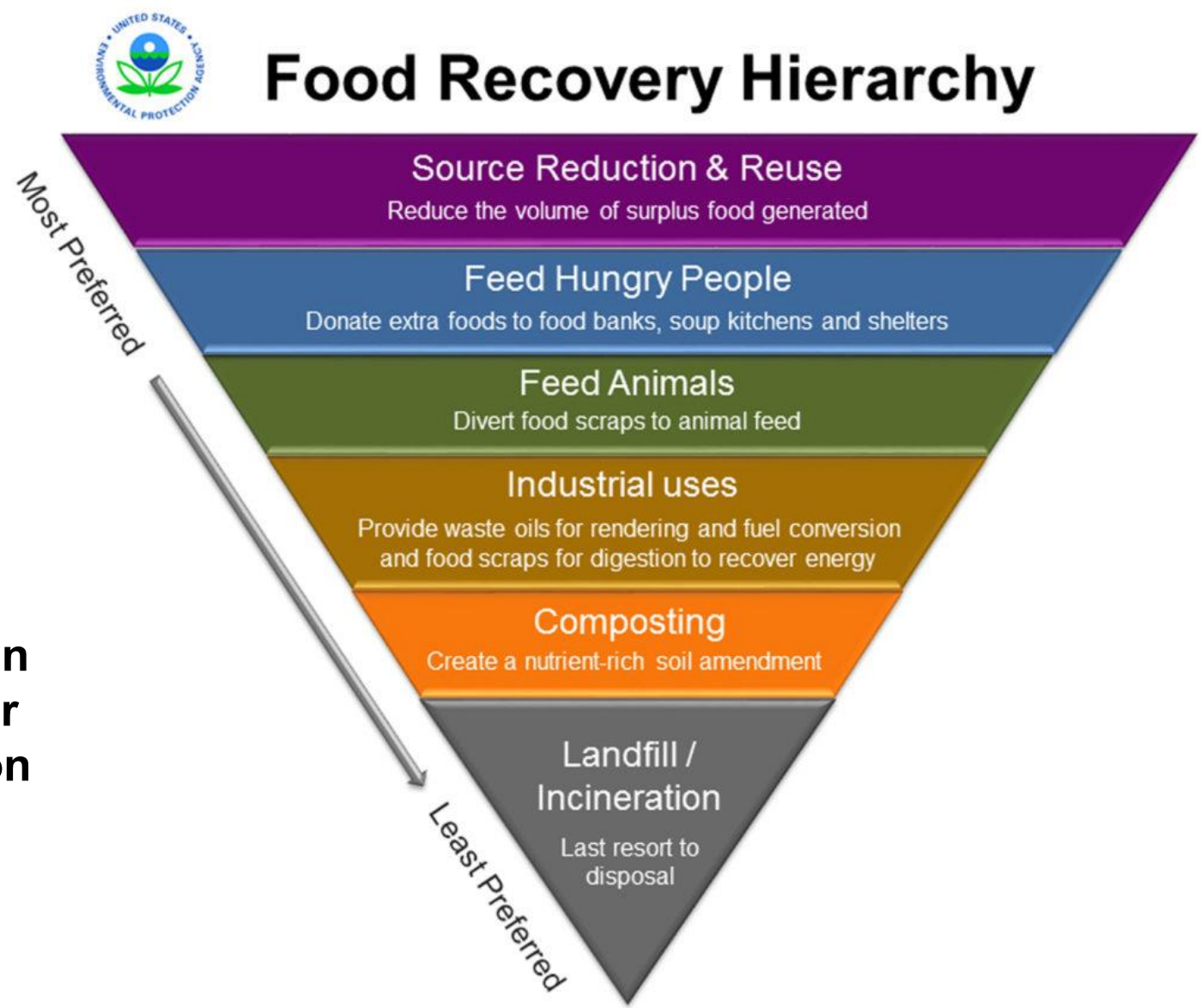
Percent of kcal lost and wasted, 2009 (numbers may not sum to 100 due to rounding)

Source: WRI analysis based on FAO. 2011. Global food losses and food waste—extent, causes and prevention. Rome: UN FAO.

WORLD RESOURCES INSTITUTE

FURTHER WITH FOOD
Center for Food Loss and Waste Solutions

What Can We Do About It?



In 2015, USDA and EPA announced a national food waste reduction goal, calling for a 50% reduction by 2030

About the Business Case

CHAMPIONS 12.3

THE BUSINESS CASE FOR REDUCING FOOD LOSS AND WASTE

A report on behalf of Champions 12.3

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

SUSTAINABLE DEVELOPMENT GOALS

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

TARGET 12.3

By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

In January 2016, “Champions 12.3” Formed to Advance Progress Toward SDG Target 12.3

Champions 12.3 is a unique coalition of

leaders from around the world

dedicated to inspiring ambition, mobilizing action, and accelerating progress

toward achieving SDG Target 12.3

The Question Champions 12.3 Asked

If it can generate so many benefits, then why are countries, cities, and companies not already doing more to reduce food loss and waste?

"Unclear business case"

"Costs buried in operational budgets"

"Accepted as cost of doing business"

"Costs of taking action outweigh the benefits"

Photo: la-ja-femme.ru
Source: Interviews

Financial Returns for Companies

>700 companies

Nearly 1,200 business sites

Across 17 countries

Photo: gamesindustry.biz

99% of Sites Had a Positive Return on Their Investment

wrap

WORLD RESOURCES INSTITUTE

Strategy for Reducing Food Loss and Waste Consists of 3 Elements

Target

Targets set ambition, ambition motivates action

Measure

What gets measured gets managed

Act

What ultimately matters is action

CHAMPIONS 12.3

FIGURE 6. Possible approaches for reducing food loss and waste (not exhaustive)

PRODUCTION	HANDLING & STORAGE	PROCESSING & PACKAGING	DISTRIBUTION & MARKET	CONSUMPTION
During or immediately after harvesting on the farm	*After leaving the farm for handling, storage, and transport*	*During industrial or domestic processing and/ or packaging*	*During distribution to markets, including at wholesale and retail markets*	*In the home or business of the consumer, including restaurants and caterers*
• Convert unmarketable crops into value-added products • Improve agriculture extension services • Improve harvesting techniques • Improve access to infrastructure and markets	• Improve storage technologies • Introduce energy-efficient, low-carbon cold chains • Improve handling to reduce damage • Improve infrastructure (e.g., roads, electricity access)	• Reengineer manufacturing processes • Improve supply chain management • Improve packaging to keep food fresher for longer, optimize portion size, and gauge safety • Reprocess or repackage food not meeting specifications	• Provide guidance on food storage and preparation • Change food date labeling practices • Make cosmetic standards more amenable to selling "imperfect" food (e.g., produce with irregular shape or blemishes) • Review promotions policy	• Reduce portion sizes • Improve consumer cooking skills • Conduct consumer education campaigns (e.g., general public, schools, restaurants) • Consume "imperfect" produce

- Improve forecasting and ordering
- Facilitate increased donation of unsold food
- Increase financing for innovation and scaling of promising technologies
- Create partnerships to manage crop flushes
- Increase capacity building to accelerate transfer of best practices

Source: Hanson, C. and P. Mitchell. 2017. *The Business Case for Reducing Food Loss and Waste.* Washington, DC: Champions 12.3

wrap

WORLD RESOURCES INSTITUTE

About Measuring (& the FLW Protocol)

Questions to Ask When Measuring

1. Why quantify?
2. What to quantify?
3. How to quantify?

About the FLW Protocol

A multi-stakeholder effort to develop a global
Food Loss and Waste Accounting and Reporting Standard
(FLW Standard)

The Consumer Goods FORUM
The Global Network Serving Shopper & Consumer Needs

WORLD RESOURCES INSTITUTE
Secretariat

World Business Council for Sustainable Development

FAO
FIAT PANIS

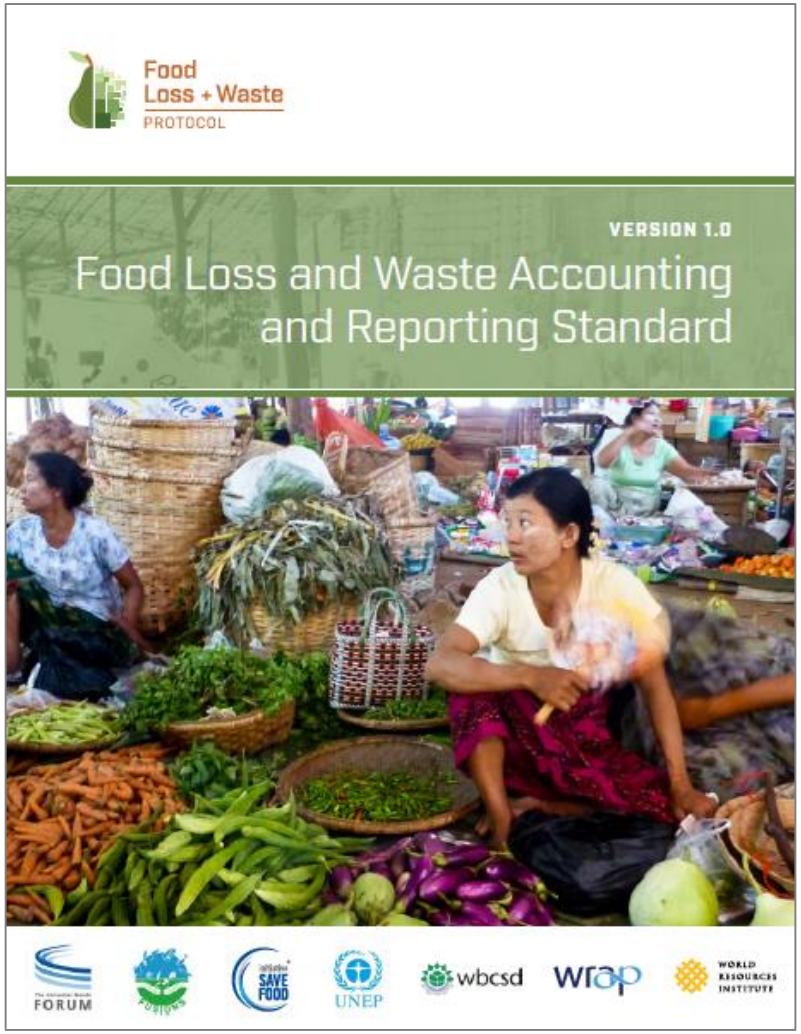
Food Loss + Waste PROTOCOL

UNEP

FUSIONS

wrap
Working together for a world without waste

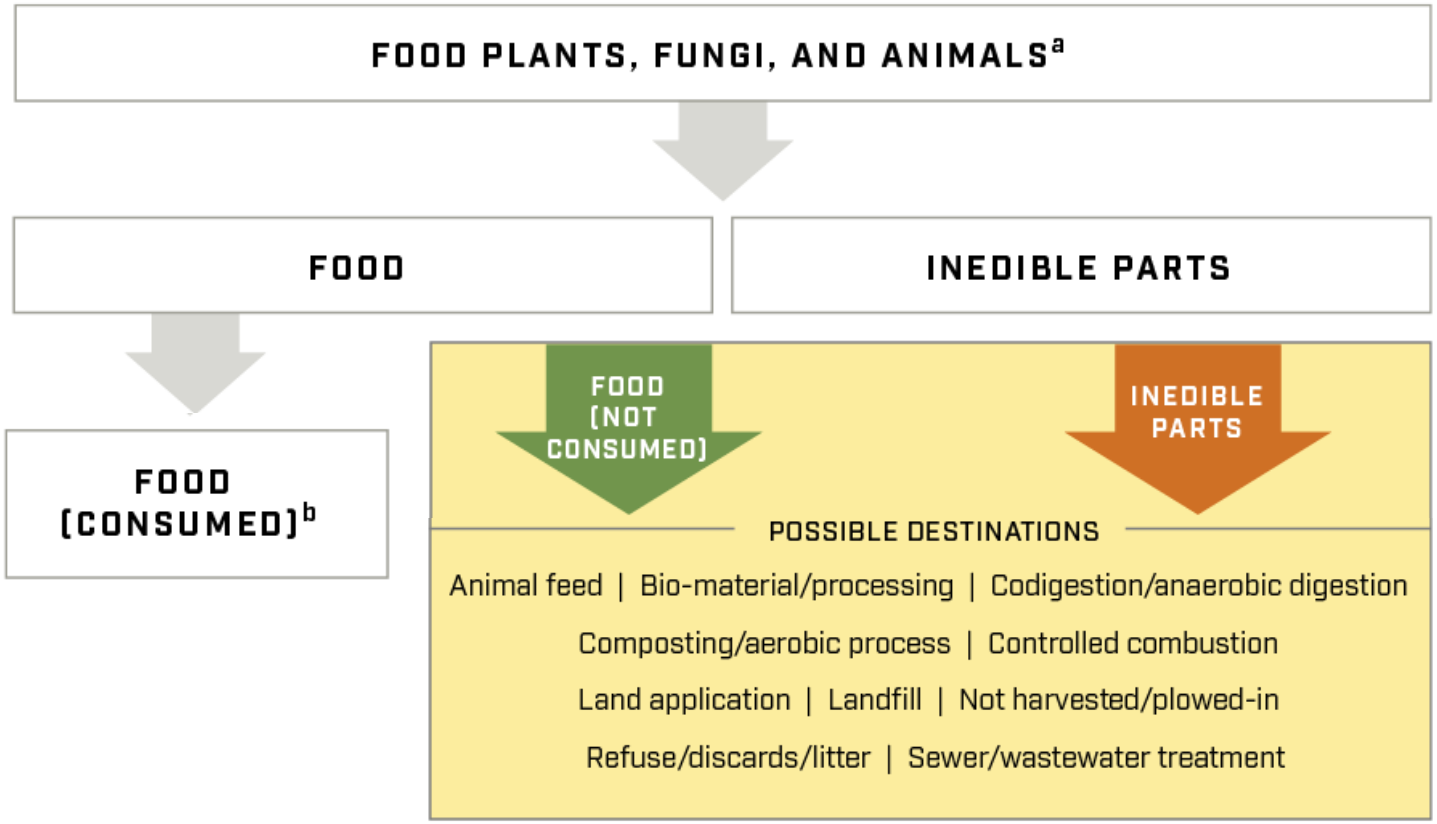
How the *FLW Standard* Can Help You



"… it gives us a clear unambiguous way for talking about food waste."

- ✓ Common language
- ✓ Consistently and transparently account and report the amount of FLW
- ✓ Globally applicable credible framework
- ✓ Practical guidance

What to Quantify?



The *FLW Standard's* accounting and reporting requirements and guidance apply to that which is in this shaded box (i.e., removed from the food supply chain)

(1) Material Types (i.e., food and/or inedible parts)

AND

(2) Destinations (where material goes when it leaves the food supply chain; 10 possibilities)

[a] Intended for human consumption (i.e.., excludes crops intentionally grown for bioenergy, animal feed, seed, or industrial use)
[b] At some point in the food supply chain (including surplus food redistributed to people and consumed)
Source: Adapted from FAO. 2014. Definitional Framework of Food Loss. Working paper of the Global Initiative on Food Loss and Waste Reduction. Rome, Italy: FAO.

Comparing Scope of US Food Loss and Waste Data

USDA: 66.5 million tons

MATERIAL TYPE

- Food ✓
- Inedible parts

DESTINATION

- Animal feed ✓
- Biomaterial/ processing ✓
- Co/anaerobic digestion ✓
- Compost/ aerobic ✓
- Controlled combustion ✓
- Land application ✓
- Landfill ✓
- Not harvested
- Refuse/discards
- Sewer ✓

VERSUS

US EPA: 36.46 million tons *disposed*

MATERIAL TYPE

- Food ✓
- Inedible parts ✓

DESTINATION

- Animal feed
- Biomaterial/ processing
- Co/anaerobic digestion
- Compost/ aerobic
- Controlled combustion ✓
- Land application
- Landfill ✓
- Not harvested
- Refuse/discards
- Sewer

Template to Visually Represent Scope Using the *FLW Standard*

TIMEFRAME

(insert timeframe)

MATERIAL TYPE

- Food
- Inedible parts

DESTINATION

- Animal Feed
- Biomaterial/ processing
- Co/anaerobic digestion
- Compost/aerobic
- Controlled combustion
- Land application
- Landfill
- Not harvested
- Refuse/discards
- Sewer

BOUNDARY

Food category = (insert text)

Lifecycle stage = (insert text)

Geography = (insert text)

Organization = (insert text)

RELATED ISSUES

Pre-harvest losses and the weight of product packaging is excluded from the weight of FLW.

(modify and/or insert additional relevant text)

This template should be customized to show your scope

Scope of Proposed European Commission Definition of Food Waste

TIMEFRAME

- 12 months (January 1 – December 31)

MATERIAL TYPE

- Food ✓
- Inedible parts ✓

DESTINATION

- Animal feed
- Biomaterial/ processing
- Co/anaerobic digestion ✓
- Compost/aerobic ✓
- Controlled combustion ✓
- Land application ✓
- Landfill ✓
- Not harvested
- Refuse/discards ✓
- Sewer ✓

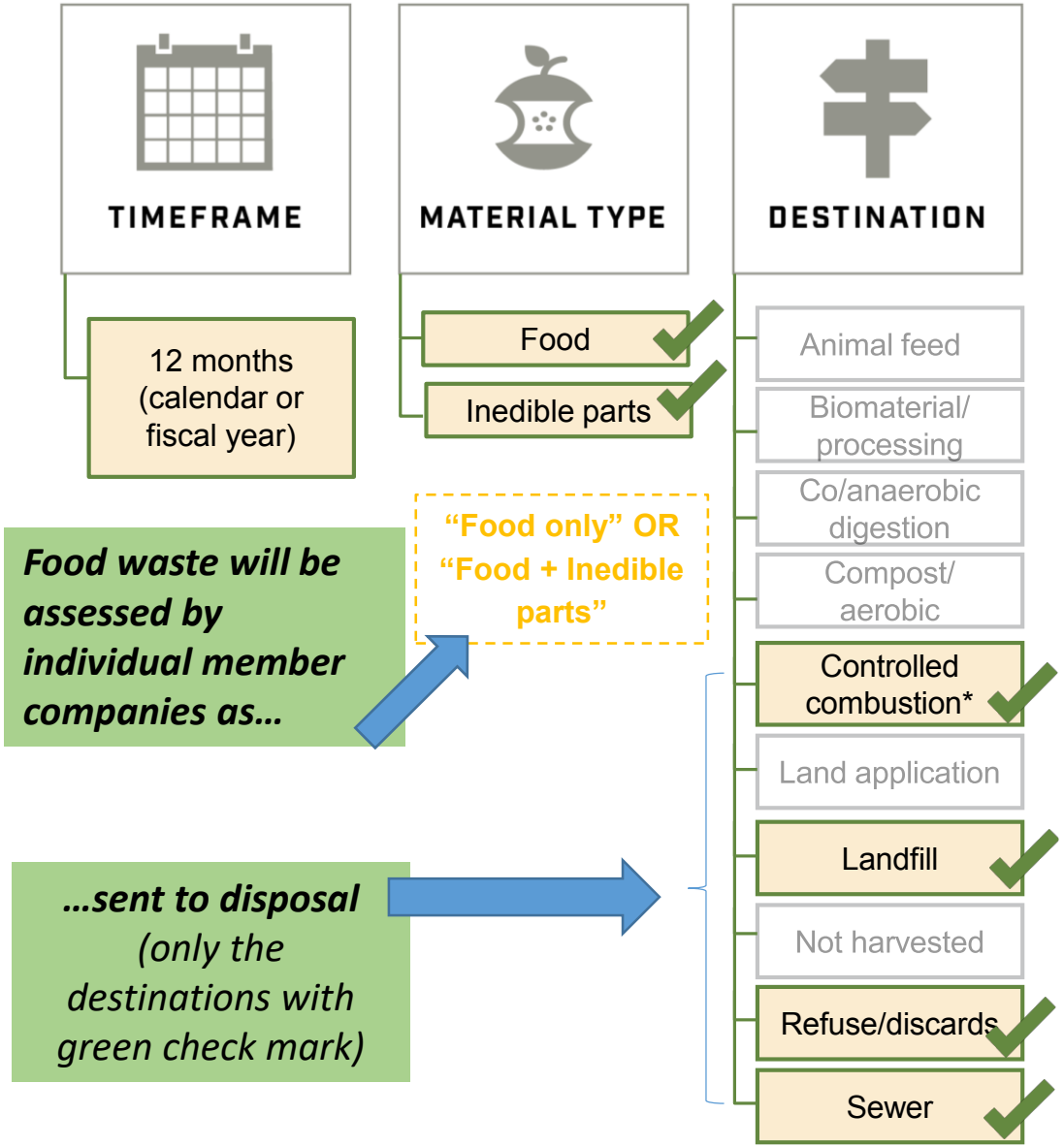
BOUNDARY

- **Food category =** All food and beverages
- **Lifecycle stage =** All (only includes farm-level FLW that's off site)
- **Geography =** Entire country
- **Organization =** All FLW-producing units

RELATED ISSUES

- Pre-harvest losses and the weight of product packaging is excluded from the weight of FLW

Scope of CGF's Food Waste Resolution



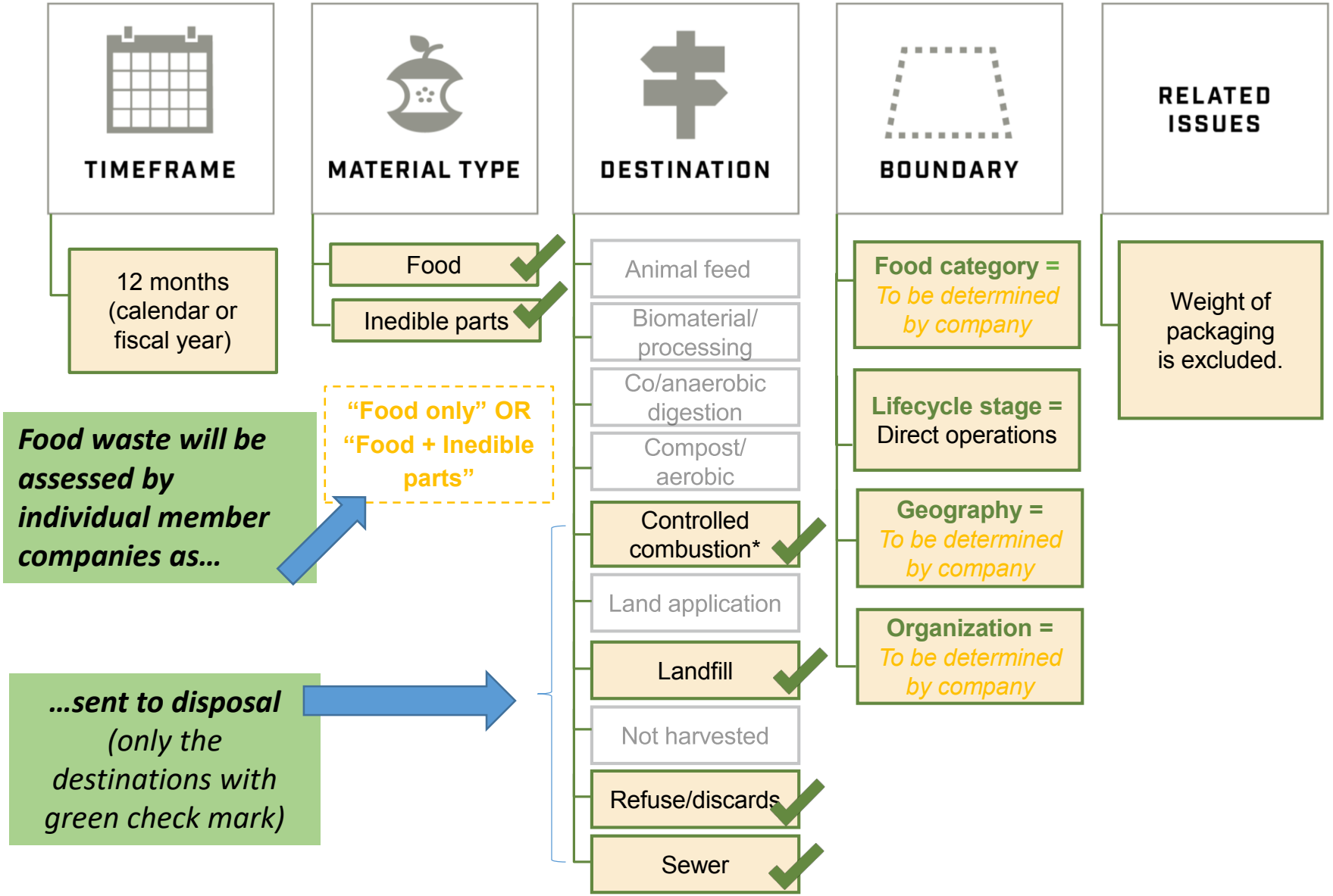
CGF GOAL

WE ARE COMMITTED TO PREVENTING FOOD WASTE AND MAXIMISING ITS RECOVERY TOWARDS THE GOAL OF HALVING FOOD WASTE BY 2025**

***Aligned with the FLW Standard; per unit of food sales in constant currency*

http://www.theconsumergoodsforum.com/sustainability-strategic-focus/waste/food-waste

Scope of CGF's Food Waste Resolution



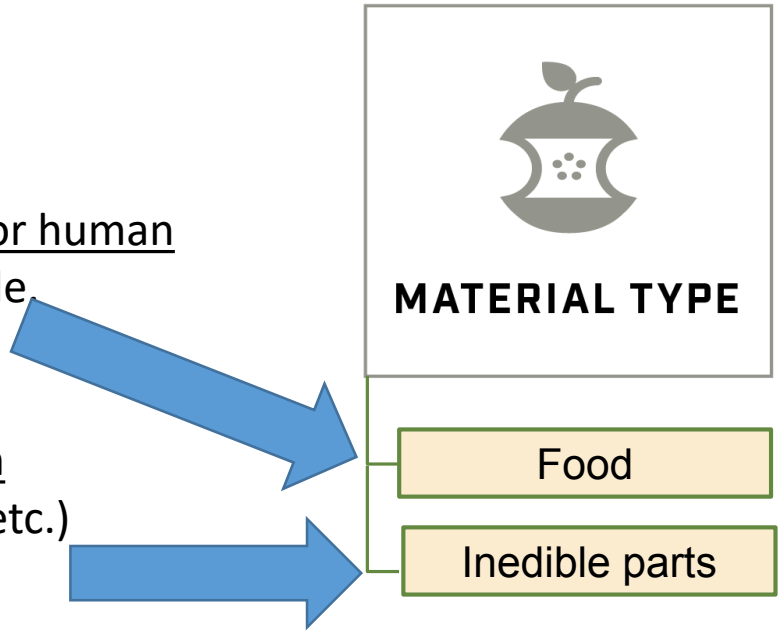
*without energy recovery

Mapping the Provision Coalition Toolkit to the *FLW Standard*

From the Glossary:

Food Waste - avoidable
Material that was at one point considered for human consumption i.e., edible or potentially edible

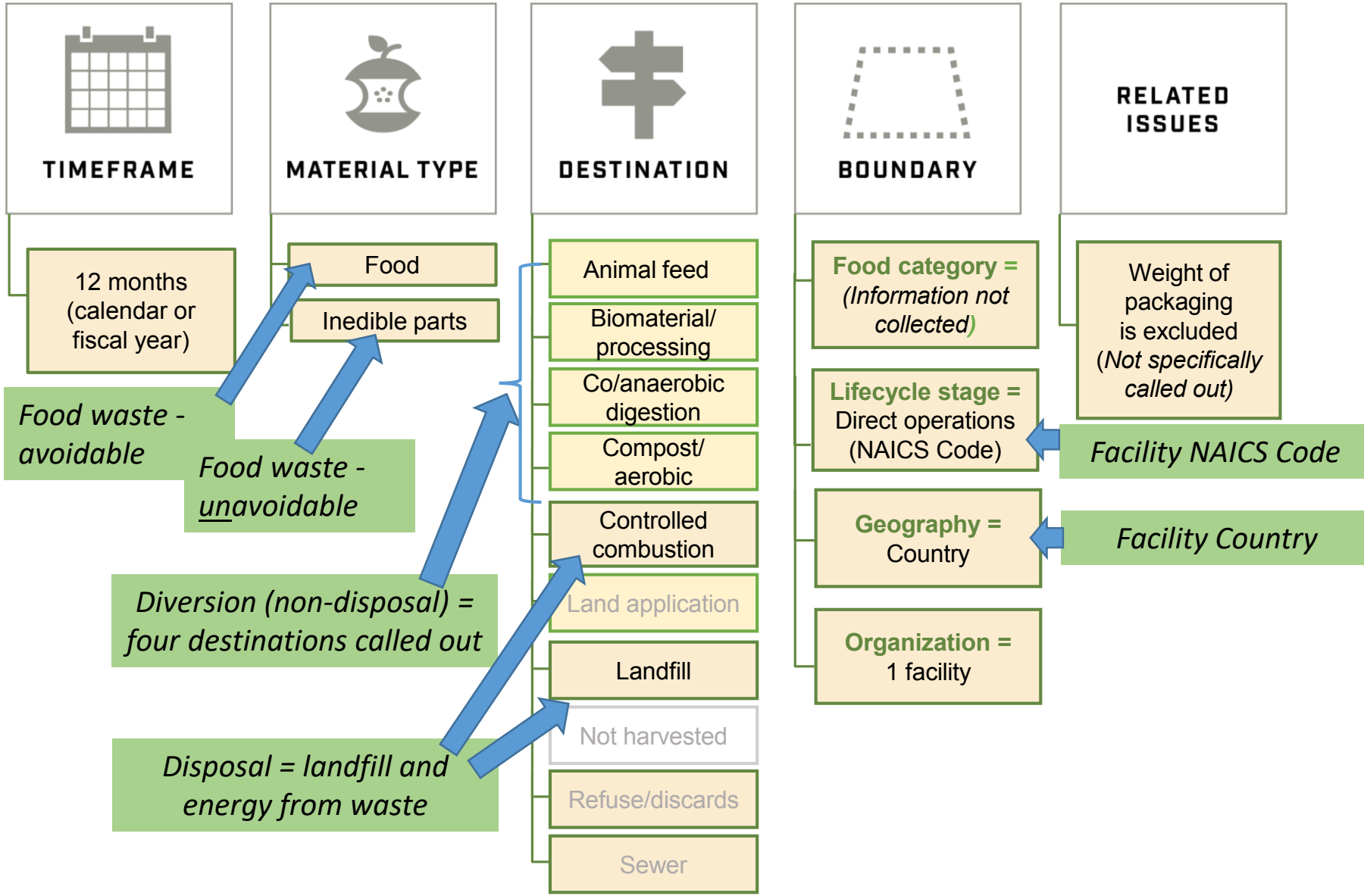
Food Waste - unavoidable
Material that was **not** considered for human consumption i.e., non-edible (bones, peels etc.)



Food Waste
Any food or beverage that can no longer be used for its intended purpose for whatever reason.

This material can be diverted to animal feed, anaerobic digestion, bio-based materials/bio-chemical processing and composting or disposed in landfills or energy from waste facilities.

Initial Mapping of Provision Coalition Toolkit to *FLW Standard*



How to Quantify?

1. Direct weighing
2. Counting
3. Assessing volume
4. Waste composition analysis
5. Records
6. Diaries
7. Surveys
8. Mass balance
9. Modeling
10. Proxy data

A suite of FLW quantification methods are available to you. The following contains guidance on ten of the most common methods, as well as guidance on how to select which are most appropriate given your circumstances.

Downloads

GUIDANCE ON FLW QUANTIFICATION METHODS (PDF)

FLW QUANTIFICATION METHOD RANKING TOOL (XLS)

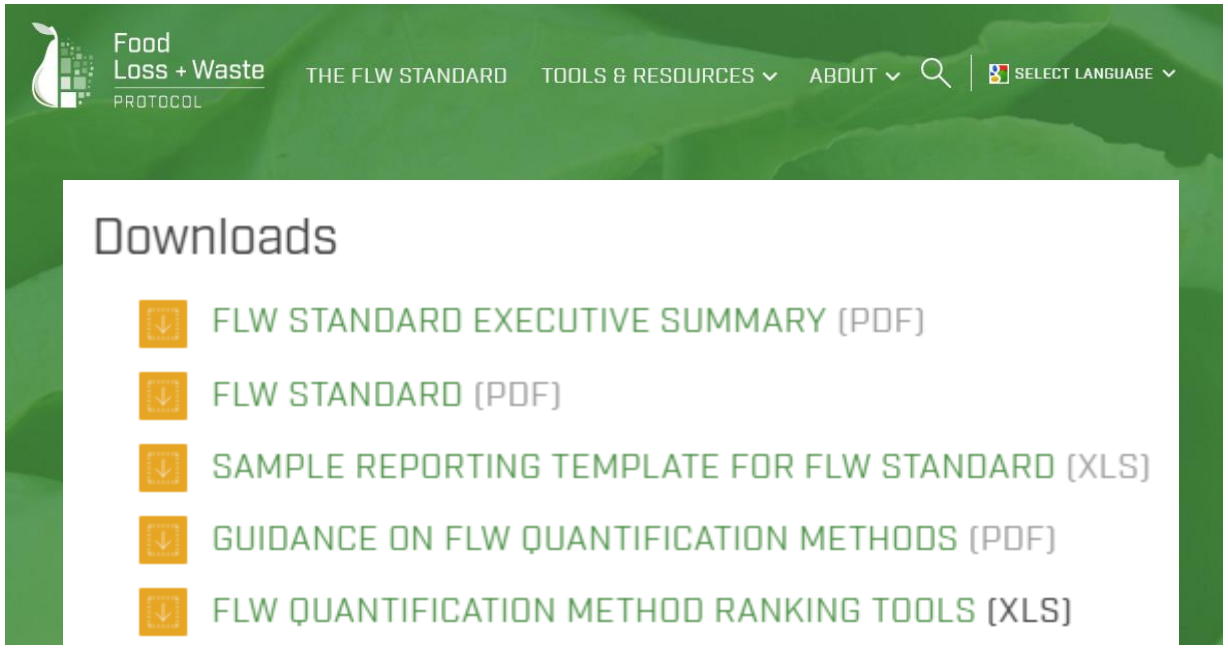
Individual Chapters from the Guidance on FLW Quantification Methods

@ www.FLWProtocol.org, under the "Tools & Resources" tab

Ways in Which to Use the *FLW Standard* and Tools (FLWProtocol.org)

Use the Standard to…

- Define "food loss and waste" (i.e., scope) using Standard's language
- Account and report consistently and transparently (8 requirements)
- Find guidance on quantifying FLW under different scenarios



TIP: Start with the Executive Summary (12-pages)

Key features included:

- Definitions related to scope
- Requirements for FLW inventory to be in conformance

How to Learn More

- ✓ Regular news update (Sign up @ www.FLWProtocol.org)
- ✓ Webinars (slides and past recordings available online)
- ✓ Case studies highlighting users of the *FLW Standard*

Food Loss + Waste PROTOCOL

DELHAIZE AMERICA'S OPERATIONS IN THE UNITED STATES: FOOD WASTE IN STORES AND DISTRIBUTION CENTERS

A Case Study

NESTLÉ DAIRY FACTORIES IN PAKISTAN: LOSSES ACROSS THE VALUE CHAIN

A Case Study

Case studies in the pipeline:

Sobeys, Tesco

Campbell's, Danone, Kellogg's

Acknowledgements | Funders of WRI's FLW initiative

The Netherlands Ministry of Economic Affairs

Note: The Ministry of Foreign Affairs of the Netherlands, the Royal Danish Ministry of Foreign Affairs, the Swedish International Development Cooperation Agency (SIDA) and the Department of Foreign Affairs and Trade of Ireland (Irish Aid) provided core funding of the World Resources Institute, which made possible the development of the Food Loss and Waste Protocol.

DISCUSSION

Food Loss + Waste PROTOCOL

www.flwprotocol.org

For questions and suggestions, contact:
Kai Robertson (robertson.kai@gmail.com)
Brian Lipinski (blipinski@wri.org)
Craig Hanson (chanson@wri.org)

APPENDIX

FLW STANDARD ACCOUNTING AND REPORTING REQUIREMENTS

1. Base FLW accounting and reporting on the principles of relevance, completeness, consistency, transparency, and accuracy

2. Account for and report the physical amount of FLW expressed as weight (e.g., pounds, kilograms, tons, metric tons)

3. Define and report on the scope of the FLW inventory

a. *Timeframe*. Report the timeframe for which the inventory results are being reported (including starting and ending date)

b. *Material type*. Account for and report the material type(s) included in the FLW inventory (i.e., food only, inedible parts only, or food and associated inedible parts).

If food or associated inedible parts removed from the food supply chain are accounted for separately in the inventory:

- Describe the sources or frameworks used to categorize a material as food or as inedible parts. This includes stating any assumptions that were used to define whether or not material was "intended" for human consumption
- Describe the approach used to calculate the separate amounts. If applicable, describe all conversion factors used and their sources

c. *Destination*. Account for and report the destinations included in the FLW inventory (i.e., where material removed from the food supply chain is directed). If the destination is unknown, then report the initial path(s) at a minimum.

d. *Boundary*. Report the boundary of the FLW inventory in terms of the food category, lifecycle stage, geography, and organization (including the sources used to classify them).

e. *Related issues*.

Packaging and other non-FLW material. Exclude from an FLW inventory any material (and its weight) that is not food or associated inedible parts removed from the food supply chain (i.e., FLW). If a calculation is needed to separate the weight of FLW from non-FLW materials (e.g., subtracting the weight of packaging), describe the approach and calculation used

Water added/removed from FLW. Account for and report the weight of FLW that reflects the state in which it was generated before water was added, or before the intrinsic water weight of FLW was reduced. If a calculation is made to estimate the original weight of FLW, describe the approach and calculation used

Pre-harvest losses. Exclude pre-harvest losses from the scope of an FLW inventory. Users may quantify such losses but shall keep data separate from the FLW inventory results

4. Describe the quantification method(s) used. If existing studies or data are used, identify the source and scope

5. If sampling and scaling of data are undertaken, describe the approach and calculation used, as well as the period of time over which sample data are collected (including starting and ending dates)

6. Provide a qualitative description and/or quantitative assessment of the uncertainty around FLW inventory results

7. If assurance of the FLW inventory is undertaken (which may include peer review, verification, validation, quality assurance, quality control, and audit), create an assurance statement

8. If tracking the amount of FLW and/or setting an FLW reduction target, select a base year, identify the scope of the target, and recalculate the base year FLW inventory when necessary

STRUCTURE OF THE *FLW STANDARD* (PARTS I, II, III)

PART I. Overview

1. Introduction
2. Definition of terms and applications
3. Goals of quantifying FLW
4. Summary of steps and requirements
5. Principles of FLW accounting and reporting

PART II. Main requirements

6. Establishing the scope of an FLW inventory
7. Deciding how to quantify FLW

PART III. Other requirements and recommendations

8. Collecting, calculating, and analyzing data
9. Assessing uncertainty
10. Coordinating the analysis of multiple FLW inventories
11. Recording causes of FLW
12. Review and assurance
13. Reporting
14. Setting targets and tracking changes over time

STRUCTURE OF THE *FLW STANDARD* (APPENDIX) & *GUIDANCE ON FLW QUANTIFICATION METHODS*

Appendix to the *FLW Standard*

A. Approaches to sampling and scaling up data

B. Separating material types: data sources for conversion factors applied to individual items

C. Normalizing data

D. Expressing weight of FLW in other terms or units of measurement

E. Quantifying and reporting the weight of food rescued

Guidance on FLW Quantification Methods (stand-alone document)

Introduction

Quantification Methods

1. Direct weighing
2. Counting
3. Assessing volume
4. Waste composition analysis
5. Records
6. Diaries
7. Surveys
8. Mass balance
9. Modeling
10. Proxy data

Appendix: Quantifying FLW if water is added

DEFINITION: *MATERIAL TYPES*

Defining Food and Inedible Parts

Food:[a] Any substance—whether processed, semi-processed, or raw—that is intended for human consumption. “Food” includes drink, and any substance that has been used in the manufacture, preparation, or treatment of food. “Food” also includes material that has spoiled and is therefore no longer fit for human consumption. It does not include cosmetics, tobacco, or substances used only as drugs. It does not include processing agents used along the food supply chain, for example, water to clean or cook raw materials in factories or at home.

Inedible parts: Components associated with a food that, in a particular food supply chain, are not intended to be consumed by humans. Examples of inedible parts associated with food could include bones, rinds, and pits/stones. “Inedible parts” do not include packaging. What is considered inedible varies among users (e.g., chicken feet are consumed in some food supply chains but not others), changes over time, and is influenced by a range of variables including culture, socio-economic factors, availability, price, technological advances, international trade, and geography.

[a]Adapted from Codex Alimentarius Commission (2013)

DEFINITION: *DESTINATIONS*

Destination	Definition
Animal feed	Diverting material from the food supply chain[a] (directly or after processing) to animals
Bio-based materials/biochemical processing	Converting material into industrial products. Examples include creating fibers for packaging material, creating bioplastics (e.g., polylactic acid), making "traditional" materials such as leather or feathers (e.g., for pillows), and rendering fat, oil, or grease into a raw material to make products such as soaps, biodiesel, or cosmetics. "Biochemical processing" does not refer to anaerobic digestion or production of bioethanol through fermentation
Codigestion/anaerobic digestion	Breaking down material via bacteria in the absence of oxygen. This process generates biogas and nutrient-rich matter. Codigestion refers to the simultaneous anaerobic digestion of FLW and other organic material in one digester. This destination includes fermentation (converting carbohydrates—such as glucose, fructose, and sucrose—via microbes into alcohols in the absence of oxygen to create products such as biofuels)
Composting/aerobic processes	Breaking down material via bacteria in oxygen-rich environments. Composting refers to the production of organic material (via aerobic processes) that can be used as a soil amendment
Controlled combustion	Sending material to a facility that is specifically designed for combustion in a controlled manner, which may include some form of energy recovery (this may also be referred to as incineration)
Land application	Spreading, spraying, injecting, or incorporating organic material onto or below the surface of the land to enhance soil quality
Landfill	Sending material to an area of land or an excavated site that is specifically designed and built to receive wastes
Not harvested/plowed-in	Leaving crops that were ready for harvest in the field or tilling them into the soil
Refuse/discards/litter	Abandoning material on land or disposing of it in the sea. This includes open dumps (i.e., uncovered, unlined), open burn (i.e., not in a controlled facility), the portion of harvested crops eaten by pests, and fish discards (the portion of total catch that is thrown away or slipped)
Sewer/wastewater treatment	Sending material down the sewer (with or without prior treatment), including that which may go to a facility designed to treat wastewater
Other	Sending material to a destination that is different from the 10 listed above. This destination should be described

[a] Excludes crops intentionally grown for bioenergy, animal feed, seed, or industrial use

DEFINITION: *BOUNDARY*

Boundary dimension	Definition	Examples
Food category	The type(s) of food included in reported FLW	• All food • Dairy products • Fresh fruits and vegetables • Chicken
Lifecycle stage	The stage(s) in the food supply chain or food lifecycle within which reported FLW occurs	• Entire food supply chain • Two stages: manufacture of dairy products, and retail of food and beverage • At home
Geography	Geographic borders within which reported FLW occurs	• World (all countries) • Eastern Asia • Ghana • Nova Scotia, Canada • Lima, Peru
Organization	Organizational unit(s) within which reported FLW occurs	• All sectors in country • Entire company • Two business units • All 1,000 stores • 100 households