



Food and Agriculture
Organization of the
United Nations



Milan Urban Food Policy Pact Monitoring Framework

March 2021 version

Indicator 41: Total annual volume of food losses & waste

MUFPP framework of actions' category: Food waste

The indicator measures (decrease in) total annual volume of food losses & waste.

Overview table

MUFPP Work stream	Food waste
MUFPP action	<p>Convene food system actors to assess and monitor food loss and waste reduction at all stages of the city region food supply chain, (including production, processing, packaging, safe food preparation, presentation and handling, re-use and recycling) and ensure holistic planning and design, transparency, accountability and policy integration.</p> <p>Raise awareness of food loss and waste through targeted events and campaigns; identify focal points such as educational institutions, community markets, company shops and other solidarity or circular economy initiatives.</p>
What the indicator measures	Total annual volume of food losses & waste
Which variables need to be measured / what data are needed	<p>-Food waste generated at system stages:</p> <ul style="list-style-type: none"> • Production • Handling and storage • Handling and storage • Distribution and point of purchase • Household/ consumption <p>- Types of food wasted</p> <p>-Edible vs inedible food</p> <p>-Destinations of food waste (landfill, composting, redistribution, etc.)</p>
Unit of measurement (i.e. Percentages, averages, number, etc.)	Tonnes or Kilograms of food waste
Unit(s) of Analysis (i.e. people under 5 years old, etc.)	Weight of food entering municipal waste stream
Possible sources of information of such data	<p>- Municipal waste management department</p> <p>- Private haulage companies</p>

Possible methods/tools for data-collection	Sampling and weighing
Expertise required	No specific expertise is required to operate a weighing device and record the results.
Resources required/estimated costs	Weighing can be costly if an entity is weighing food loss and waste from more than one location. In addition to the initial purchase or rental of a weighing device, transport of the device and personnel can be cost-prohibitive, particularly in areas with poor vehicular access. The main constraints on weighing, however, are logistics and feasibility rather than cost ¹ .
Specific observations	
Examples of application	The Natural Resources Defense Council describes the results of a food waste baseline assessment study in three U.S. cities—Denver, Nashville, and New York City—for residential and non-residential sectors, including the industrial, commercial and institutional sectors. The intent of the study was to characterise the amount of food that is wasted in these cities, identify some of the reasons why the food is going to waste, and then use that data to help inform and inspire initiatives to prevent wasting food, to rescue surplus food to benefit people in need, and to recycle food scraps. Outputs from the study not only include the results of the research, but also templates and descriptions of the methodologies in hopes that this study will contribute to a working model for other cities to perform similar assessments ² .

Rationale/evidence

A significant share of food grown for human consumption is never eaten. It is estimated that one third, by weight, of all food produced in the world was lost or wasted in 2009. This equates to US\$940 billion per year in economic losses and is linked to approximately one quarter of all water used by agriculture³. Food is lost or wasted throughout the supply chain, from production to household consumption. Food waste that rots in landfills emits harmful greenhouse gases. Target 12.3 of the United Nations Sustainable Development Goals calls for the halving of per capita global food waste by 2030.

Cities are key players because they are responsible for solid waste services and have economic, social and sustainability goals that food waste solutions can support. Many cities have analysed the types of materials that end up in the waste stream, few have done comprehensive food waste assessments, especially at the household level. Local governments need further data on the types of food that ends up in the waste stream, what proportion is edible versus inedible and why the food is wasted. This lack of information and the variations in methodologies are barriers to developing strategies to reduce food loss and waste. The World Resources Institute has developed a comprehensive “Food Loss and Waste Accounting and Reporting Standard” to facilitate the quantification of food loss and waste (FLW) and encourage consistency and transparency of the analyses⁴.

Glossary/concepts/definitions used

Food Loss and Waste: All edible and inedible parts that are discarded or wasted.

¹ World Resources Institute (2017). Guidance on FLW Quantification Methods: Supplement to the Food Loss and Waste (FLW) Accounting and Reporting Standard, Version 1.0. Available from http://flwprotocol.org/wp-content/uploads/2017/06/FLW-Protocol_Guidance-on-FLW-Quantification-Methods.pdf.

² Natural Resources Defense Council (2017). Estimating Quantities and Types of Food Waste at the City Level. Available from <https://www.nrdc.org/sites/default/files/food-waste-city-level-report.pdf>.

³ FAO (2011). Global food losses and food waste: Extent, causes and prevention. Rome. <http://www.fao.org/docrep/014/mb060e/mb060e00.pdf>

⁴ World Resources Institute (2017). Food Loss and Waste Accounting and Reporting Standard. Available from https://www.wri.org/sites/default/files/REP_FLW_Standard.pdf.

Food: Any substance that is intended for human consumption. This includes beverages 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.

Inedible Parts: Components associated with 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.

Destination: Where material removed from the food supply chain is directed, such as landfill, animal feed, composting, etc.

Preparations

A meeting should be organised with all staff who will be involved in this activity to:

- Familiarise them with food loss and waste assessments
- Agree on the objectives and scope of the analysis and data collection requirements
- Define the methodology to be applied for data collection and analysis, and
- How to coordinate the activities.

Sampling:

In many instances it will be impractical to weigh all the Food Loss and Waste (FLW), in which case a sample of FLW should be taken and weighed. Sampling is the process of choosing to measure or approximate, over a given period of time, the amount of FLW from a subset of FLW-producing units within a population, or from a fraction of the physical FLW produced. An entity may undertake both these types of sampling, which involve the following.

Selecting a representative sample impacts the accuracy of the data. It is important that the sample of FLW is as representative as possible of all units and all FLW in the population. There are two main approaches to sampling FLW-producing units, which differ in how well the data produced represents all units. The approaches are “probability” and “non-probability” sampling. In probability sampling, all FLW-producing units in the population stand a known and equal chance of being selected, thus produce a random sample that can statistically represent the characteristics of the whole population being studied. In non-probability sampling, the likelihood of any one FLW-producing unit being selected is often not known (e.g., sometimes because the exact size and nature of the population from which the sample will be drawn are not fully understood). Non-probability samples are less reliable indicators of the characteristics of the whole population. For further guidance, see Appendix A “Approaches to Sampling and Scaling Up Data” in the Loss and Waste Accounting and Reporting Standard (World Resources Institute, 2017).

Data Collection and Analysis

WRI’s Food Loss and Waste Accounting and Reporting Standard⁵ provides detailed steps for data collection methods and data analyses. Please refer to the following resources for further clarification:

- Chapter 8: Collecting, Calculating, and Analysing Data
- Chapter 11: Recording Causes of Food Loss and Waste

⁵ World Resources Institute (2017). Food Loss and Waste Accounting and Reporting Standard.

For a clear language step by step guide to residential household waste assessment, see Chapter 3 of NRDC's Estimating Quantities and Types of Food Waste at the City Level. Chapter 4 provides an overview of industrial, commercial and institutional waste assessments.

References and links to reports/tools

Eurostat (2012). Guidance on municipal waste data collection.

World Resources Institute (2017). Food Loss and Waste Accounting and Reporting Standard. Available from https://www.wri.org/sites/default/files/REP_FLW_Standard.pdf.

World Resources Institute (2017). Guidance on FLW Quantification Methods: Supplement to the Food Loss and Waste (FLW) Accounting and Reporting Standard, Version 1.0. Available from http://flwprotocol.org/wp-content/uploads/2017/06/FLW-Protocol_Guidance-on-FLW-Quantification-Methods.pdf.

WRAP Cymru (2016). National municipal waste compositional analysis in Wales.