Monitoring SDG 12.3
Measuring progress

EU Platform on Food Losses and Waste
Vilnius, 24 May 2018
Carola Fabi, FAO, James Lomax, UNEP
Outline

• Overview
  • Governance, institutional architecture
  • Current Status and Goals

• Global Food Loss Index
  • Main Principles and Methodology
  • Next steps for the up-grade

• Food Waste Index specifics
  • Suggested equation
  • Initial thoughts on methodology
Governance and Institutional architecture

“By 2030 halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains including post-harvest losses”
Governance and Institutional architecture

**Food Loss Index**
Focuses on the *supply* side of the market and decreasing losses in the supply chain

“By 2030, ...”

**Food Loss**
“...reduce food losses along production and supply chains, including post-harvest losses.”

**Waste Index**
Focuses on retail and consumer sectors and improving the efficiency on the *demand* side of the supply chain

“...halve per capita global *food waste* at the retail and consumer levels.”

EU Platform on Food Losses & Waste – 24th May 2018
Current Status and Goal

• Goal: Upgrade SDG 12.3 indicators to Tier II
  • **By November 2018**: Joint proposal for a Food Loss Index and Food Waste Index at next Inter-Agency Expert Group meeting on SDG’s

• Current Status is Tier III
  • Global Food Loss Index: request for more pilot tests by the IAEG-SDG
  • Food Waste Index: not available yet
Food Loss Index
Boundaries between the FLI and the FWI

Harvest losses: can be added to the Loss coverage and measured with Crop-cutting surveys.
On-farm waste: potential area of interest and collaboration with the EU.

Losses in the FBS fw
Losses in SDG 12.3

Clearer boundaries will be set here!
Definitions: Food Losses

• **FAO AGRICULTURAL STATISTICS**

  • **Food losses** Crop and livestock product losses cover all quantity losses along the supply chain for all utilizations (food, feed, seed, industrial, other), up to the retail/consumption level. Losses of the commodity as a whole (including edible and non-edible parts) and losses, direct or indirect, that occur during storage, transportation and processing, also of relevant imported quantities, are therefore all included.

• **2016 DEFINITIONAL FRAMEWORK**

  • **Food loss and waste (FLW):** The decrease in quantity or quality of food.

  • **Food losses** in the production to distribution segments of the FSC is mainly caused by the functioning of the food production and supply system or its institutional and legal framework.

Definitions differ for qualitative losses, non-edible parts, value chain boundaries – treatment of pre-harvest and harvest losses
FLI - Main principles and methodology

1. Focuses on 10 key commodities in 5 main groups
2. Measures Food Loss Percentages (FLP) and not on total losses
3. Monitors changes in the Food Loss Percentage over time
4. Based on nationally representative loss percentages along the supply chain
FLI – Top 10 commodities within 5 Groups

To ensure relevance for countries and some degree of comparability at international level:
- Loss statistics cannot cover the entire basket
- Trade-off between relevance at country level and comparability across countries: the same commodities are not relevant for all countries

The five groups are representative of a diversified diet
FLI – Uses percentages to track structural losses

A Food Loss Percentage (FLP) can be interpreted as the percentage of production that does not reach the retail stage.
Each commodity’s supply chain can be disaggregated down to stage. Estimates for the different stages can come from various instruments and tools.

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Item 2</th>
<th>Item 3</th>
<th>Item 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest</td>
<td>Farm</td>
<td>Transport</td>
<td>Storage</td>
</tr>
<tr>
<td>Harvest</td>
<td>Farm</td>
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<td>Farm</td>
<td>Transport</td>
<td>Storage</td>
</tr>
</tbody>
</table>

Nationally Representative Loss percentages \( l_{ijt} \) by commodity

Weighted Aggregation of all commodities in the country basket =⇒ FLP

\[
\text{Food Loss Percentage}_{it} = \frac{\sum_j l_{ijt} \cdot \text{weights}_{t=0}}{\sum_j (\text{weights}_{t=0})}
\]
FLI - Underlying data: compiling the Food Loss Index

Food Loss Index (year t) = \( \frac{\text{Food Loss Percentage}_{i(\text{year t})}}{\text{Food Loss Percentage}_{i(\text{Baseline year})}} \times 100 \)
FLI - Monitoring trends

<table>
<thead>
<tr>
<th>Year</th>
<th>FLP</th>
<th>FLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>5.7%</td>
<td>100.0</td>
</tr>
<tr>
<td>2006</td>
<td>5.7%</td>
<td>99.9</td>
</tr>
<tr>
<td>2007</td>
<td>5.6%</td>
<td>99.8</td>
</tr>
<tr>
<td>2008</td>
<td>5.6%</td>
<td>99.7</td>
</tr>
<tr>
<td>2009</td>
<td>5.6%</td>
<td>99.6</td>
</tr>
<tr>
<td>2010</td>
<td>5.6%</td>
<td>99.5</td>
</tr>
<tr>
<td>2011</td>
<td>5.6%</td>
<td>99.4</td>
</tr>
<tr>
<td>2012</td>
<td>5.6%</td>
<td>99.3</td>
</tr>
<tr>
<td>2013</td>
<td>5.6%</td>
<td>99.3</td>
</tr>
<tr>
<td>2014</td>
<td>5.6%</td>
<td>99.2</td>
</tr>
<tr>
<td>2015</td>
<td>5.6%</td>
<td>99.1</td>
</tr>
<tr>
<td>2016</td>
<td>5.6%</td>
<td>99.0</td>
</tr>
</tbody>
</table>
Data collection methods: Guidelines on the measurement of losses

- Range of surveys and sample-based statistical tools
- To obtain nationally representative loss estimates
- Grounded in the National Statistics Systems
- Drawn from 40 years of methodological literature and field practice

**Grains**
Published and tested

**Fruits and Vegetables, Milk and Meat, Fish and products**
Training course on postharvest losses surveys for grains

This material is for in-classroom training on the measurement of harvest and post-harvest losses for food grain targets. It is designed for decision makers, survey managers, questionnaire designers, trainers of field staff and data analysts interested or involved in the measurement of food losses.

Training course on SDG 12.3.1 Global Food Loss Index: in progress

EU Platform on Food Losses & Waste – 24th May 2018
Next steps

1. Further improvements on the methodological proposal
   • Webinar in June
   • Online consultation June-August
   • Improve on on-farm losses to include on-farm waste (EU)

2. Pilot testing the Guidelines on Fruits and Vegetables, Milk and Meat, Fish and products

3. Pilot testing the Food Loss Index:
   • India, USA, Turkey

4. Revised submission to the IAEG-SDG by November 2018
Food Waste Index
Timescales and Approach

- Project to develop Food Waste Index methodology started in January 2018
- Led by UN-Environment, involves UN-FAO, World Resources Institute (WRI), WRAP
- Builds on existing methodologies e.g. Food Loss and Waste Standard, FUSIONS manual
- This is the first pilot
- Aiming to present piloted approach to Inter-Agency Expert Group on SDGs (IAEG-SDG) November 2018
Overlap with other SDG indicators

• Following two indicators both cover waste

• Opportunities to collect related data for multiple indicators
  • 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities (Tier II, UN-Habitat, UNSD)
  • 12.5.1 National recycling rate, tons of material recycled (Tier III, UNSD, UN Environment)
Boundaries and aggregation

**Food Loss Index: SUPPLY-SIDE**

- **FLI Covers:**
  - 10 top commodities/country
  - From product maturity up to but excluding retail
  - Provides an average

- **Limitations:**
  - Loss dynamics of less important commodities is not included
  - Only primary processing losses are included

**Indices Do Not Cover:** Less important commodities from “production up to but excluding retail”

**Options for Covering This Gap:**
Use modelling or other methods to gather additional data to calculate losses for other commodities, starting at the point of product maturity

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**Food Waste Index: DEMAND-SIDE**

- **FWI Covers:**
  - Mixed stream of products
  - From processing/manufacturing through to consumption
  - Provides total weight

- **Limitations:**
  - Breakdown by commodity or product is not available

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**Overlap:**
Data may overlap here
<table>
<thead>
<tr>
<th>Production</th>
<th>Handling &amp; Storage</th>
<th>Processing &amp; Packaging</th>
<th>Distribution &amp; Market</th>
<th>Consumption</th>
</tr>
</thead>
</table>

**Food Loss Index: SUPPLY-SIDE**

- **FLI Covers:**
  - From product maturity up to but excluding retail
  - 10 top commodities / country

<table>
<thead>
<tr>
<th>overlap</th>
</tr>
</thead>
</table>

**Data may overlap here**

**Food Waste Index: DEMAND-SIDE**

- **FWI Covers:**
  - Manufacturing / processing
  - Distribution, retail, wholesale, markets
  - Out-of-home consumption (e.g. restaurants, hotels, canteens in schools, offices, prisons, hospitals, etc.)
  - Household

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**Indices Do Not Cover:** Less important commodities from “production up to but excluding retail”
Food Waste Index – Equations

The FW Index tracks progress as kg / capita / year.

\[
\text{Food waste per capita} = \frac{\text{Total food waste}}{\text{Population}}
\]

Where total food waste is the sum of that in the four sectors:

\[
\text{Total food waste} = \text{FW}_{\text{Household}} + \text{FW}_{\text{Out of home consumption}} + \text{FW}_{\text{Retail}} + \text{FW}_{\text{Manufacture}}
\]

The **Food Waste Index** compares food waste per capita in year \(t\) with a baseline year:

\[
\text{Food Waste Index} = \frac{\text{Food waste per capita in year } t}{\text{Food waste per capita in base year}} \times 100
\]
### Example based on hypothetical country

<table>
<thead>
<tr>
<th>Year</th>
<th>Weight of FW (tonnes)</th>
<th>Country population</th>
<th>FW (kg per person)</th>
<th>Comparison with base year</th>
<th>FW INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>360,000</td>
<td>3,000,000</td>
<td>120</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2020</td>
<td>324,000</td>
<td>3,200,000</td>
<td>101</td>
<td>0.84</td>
<td>84</td>
</tr>
<tr>
<td>2022</td>
<td>291,600</td>
<td>3,400,000</td>
<td>86</td>
<td>0.71</td>
<td>71</td>
</tr>
<tr>
<td>2025</td>
<td>262,440</td>
<td>3,700,000</td>
<td>71</td>
<td>0.59</td>
<td>59</td>
</tr>
<tr>
<td>2030</td>
<td>254,000</td>
<td>4,200,000</td>
<td>60</td>
<td>0.50</td>
<td>50</td>
</tr>
</tbody>
</table>
Steps for FW quantification

Review existing data

- **Purpose:** Understand what data already exists

Develop quantification plan

- **Purpose:** create a quantification plan for FW Index for baseline and subsequent years
- **Can use existing data or undertake new measurement**

Quantify FW

- **Purpose:** to quantify food waste in relevant sectors
- To analyze above information to obtain information for FW Index

Report FW

- **Purpose:** to report FW data and metadata to allow the FW Index to be created
## Quantification plan – household example

<table>
<thead>
<tr>
<th>Review existing data</th>
<th>Develop quantification plan</th>
</tr>
</thead>
</table>
| Find out what data is collected on waste coming from households: e.g.  
  ▪ Municipal waste statistics?  
  ▪ Waste compositional studies?  
  ▪ Diaries or surveys?  
Determine accuracy and likely biases in existing estimates  
Determine coverage of waste streams, destinations, ‘informal’ sector | Determine if existing estimates can be used for the baseline:  
  ▪ Degree of accuracy?  
  ▪ Coverage of waste streams?  
  ▪ Replicable for future years?  
If further measurement required, consider:  
  ▪ Where to intercept waste to accurately quantify (at entrance to waste treatment / disposal facility or at kerbside?)  
  ▪ Sampling design, including geography, time frame, seasonality  
  ▪ Measurement methods |
Quantification plan – retail, wholesale, markets

<table>
<thead>
<tr>
<th>Review existing data</th>
<th>Develop quantification plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find out what data is collected on food waste in sector. Is measurement undertaken by</td>
<td>How could food waste be measured accurately and cost effectively?</td>
</tr>
<tr>
<td>▪ Retailers</td>
<td>Could companies measure and share data regularly, e.g. via a voluntary agreement or legislation?</td>
</tr>
<tr>
<td>▪ Markets</td>
<td>Is a Government survey of food waste in company waste streams feasible?</td>
</tr>
<tr>
<td>▪ Wholesalers</td>
<td>▪ Cost?</td>
</tr>
<tr>
<td>▪ Trade bodies</td>
<td>▪ Access to waste?</td>
</tr>
<tr>
<td>▪ Government surveys of commercial / industrial waste</td>
<td></td>
</tr>
<tr>
<td>If information exists, how is it measured:</td>
<td></td>
</tr>
<tr>
<td>▪ Measurement methods</td>
<td></td>
</tr>
<tr>
<td>▪ Coverage of food waste destinations (e.g. landfill only, or a wider range of destination)</td>
<td></td>
</tr>
</tbody>
</table>
Methodology for Food Waste Index recently under development for piloting

Four sectors covered by Food Waste Index

Definition of which material and destinations are included

Process for quantification of food waste outlined

Examples of process given for two sectors