“SDG 12.3.1.a Food Loss Index”

Understanding and building the indicator

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Outline

1. SDG indicator 12.3.1 - Boundaries and definitions
2. Focus the evidence base and set data collection prioritie
3. Status of knowledge on Food Loss
4. Food Loss Index (FLI) :Structure, interpretation, compilation
5. Available Resources and way forward
“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”

SDG TARGET 12.3
**FOOD POST-HARVEST LOSSES**

State of Play: SDG 12.3 target and indicators

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

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

- **Food Loss**
  - “By 2030, ... reduce food losses along production and supply chains, including post-harvest losses.”

- **Food Waste**
  - “…halve per capita global food waste at the retail and consumer levels.”
Boundaries between the FLI and the FWI
Challenge: Aggregation of Food Losses and Waste

Issue: reconcile percentage food losses by commodity with tons of bulk per capita food waste

Domestic Availability & Net Imports

Food Available at the retail level can be found in the FBS (tons, tons/per capita)

Waste/Other Utilizations

Secondary Middlemen (e.g. Food Banks)

Hospitality & Food Service

Retail (Grocery)

Household Consumption

Outside-Household Consumption

Food preparations and Distribution

Losses (tons, %) by Primary Commodity -> FLI

Farm

Transport

Storage

Wholesale

Processing

Harvest

Issue: reconcile percentage food losses by commodity with tons of bulk per capita food waste

FWI Waste (tons, tons/per capita)

As a % of Municipal Solid Waste

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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
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FOCUS THE EVIDENCE BASE AND SET DATA COLLECTION PRIORITIES
Policy relevance: Understanding the data needs

The political decision on priorities in food loss reduction might be influenced by:

Contribution to total food losses (in volume, in percentages)
Relevance of the food loss points (e.g. income, number of people involved, poverty and food insecurity, etc.)
Cost-effectiveness of a possible intervention (e.g. opportunities, cost of intervention, number of actors needed to be addressed, etc.)

Loss data must be complemented with other information
Impact of reductions on food security and nutrition

PRICE AND INCOME EFFECTS OF FOOD LOSS AND WASTE REDUCTION ALONG THE SUPPLY CHAIN
FOOD POST-HARVEST LOSSES

Focus on key Commodities and critical loss points

Setting a common basket of goods for global monitoring is a challenge: the same commodities are not relevant for all countries. Loss statistics cannot cover the entire basket. Trade-off between relevance at country level and comparability across countries.

Comparability
Build the international basket under 5 headings, by selecting two commodities under each:
1. Cereals & Pulses;
2. Fruits And Vegetables;
3. Roots, Tubers & Oil-Bearing Crops;
4. Animals products;
5. Fish and fish products
6. Other crops (stimulants, spices, sugar, etc.)

Relevance
Countries determine the two commodities in each heading
- Policy focus
- Economic relevance
- Food security relevance
CURRENT STATUS ON FOOD LOSS
Food Losses by Region (SOFA 2019)

From post-harvest to (but excluding) retail stage

Percentage of food loss globally and by region:

- Eastern and South-eastern Asia
- Western Asia and Northern Africa
- Central and Southern Asia
- Sub-Saharan Africa
- Latin America and The Caribbean
- Australia and New Zealand
- Oceania (excluding Australia and New Zealand)
- Northern America and Europe

World
FOOD POST-HARVEST LOSSES

Heatmap of available data- East and South-East Asia

This is based on literature review of openly available food loss data and published on the FAO’s FLW database which can be accessed through the link below:


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Losses for Fruits and Vegetables by stages – East and SE Asia

This shows the level and variability of losses at each stage and therefore inform targeted intervention measures along the value chain.

NB: Graph based on information from available literature.

Losses for Fruits and Vegetables by stages – East and SE Asia

Source: FAO FLW dataset (accessed Feb. 2020)
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FOOD LOSS INDEX (FLI) structure, interpretation, compilation
The Food Loss Index (FLI)

The Food Loss Index (FLI) measures progress towards SDGTarget 12.3.

The index starts at 100 in the base period. Losses are reduced if the index moves below 100.

The FLI focuses on food losses that occur from production up to (and not including) the retail level. It measures the changes in percentage losses for a basket of 10 main commodities by country in comparison with a base period.
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FLI interpretations and compilation steps

- A Food Loss Percentage can be interpreted as the percentage of production that does not reach the retail stage.

Steps to compiling the Index if the data exists:
Select Basket of commodities and compile weights
Compile Food Loss Percentages
Compare Food Losses over time

Food Loss Index

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FLI step 1: loss percentages by commodity

Percentage losses versus total losses
Loss percentages can be observed or survey-based (guidelines for data collection) or estimated (model-based)

\( l_{ijt} \) is the loss percentage (Where: \( j \) = commodity, \( i \) = country, \( t \) = year)

FBS example.
Losses are estimated by the country using a constant factor of 15%. Production and losses in tons fluctuate.
Step 1: measuring the loss percentage of each commodity

Losses are estimated in each stage of each commodity’s supply chain.
Different methods and tools can be used in the estimation.
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**Steps 1 and 2:** From the loss percentage by commodity to the Food Loss Percentage of a country

Weighted Aggregation by economic value of all commodities in the country basket => FLP

\[
Food Loss Percentage_{it} = \frac{\sum_j l_{ijt} \times weights_{t=0}}{\sum_j (weights_{t=0})}
\]
FLI step 3: Countries’ Food Loss Index (FLI)

Step 3: Calculate the country Food Loss Index

\[ FLI_{it} = \frac{FLP_{it}}{FLP_{it_0}} \times 100 \]

Where:
- \( i \) = country,
- \( t \) = year
- \( t_0 \) is the base year (set at 2005 for the moment)
- \( FLP_{it} \) is the country Food Loss Percentage

The country FLI shows the change in the Food Loss Percentage over time (compared to a base period)
AVAILABLE RESOURCES AND WAY FORWARD
The FLW Database

- online collection of data
- on food loss and food waste
- causes of FLW reported in the literature
- data from openly accessible reports / studies and FAOSTAT
- all food categories, stages of the value chain, and geographical areas.

Data can be interactively queried, downloaded, and plotted.

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SDG methodology, measurement Guidelines, pilot survey report and data collection tools

E.g. Published harvest and post harvest loss measurement guideline for cereals and pulses

Published: http://www.fao.org/3/CA2640EN/ca2640en.pdf

E.g. Fish Survey questionnaires


E-Learning Course on FLI (Available soon)

An online course on compiling the FLI has been created and will be available soon. The course comprises of five modules as follows:

Lesson 1: Overview of target 12.3

Lesson 2: How the indicator monitors the supply side of target 12.3

Lesson 3: How to collect nationally representative data and link to the Food Loss Assessment methodology

Lesson 4: Overview of the modelled estimates to compile the FLI in the absence of survey based data

Lesson 5: Tools to monitor and report on losses
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A cost-effective mix of measurement and estimation methods

Data collection ≠ Measurement ≠ Estimation

Data collection
Which units to select? How?
How many?

Measurement
How to “measure” losses?
Using which technique?

Estimation
Which aggregated indicators?
How to compile them (averages, variances, etc.)?

Approaches for the estimation of crop losses

Sample survey

Farmer’s declarations
Physical measurements
Visual scales, standard charts

Statistically representative estimates

Experimental designs
Rapid appraisals

Technical relationships, calibration
Statistical inference
Econometric modelling

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Measurement methods: objective vs subjective

Farmer’s declarations < Objective measurements
A two-pronged and collaborative approach to data collection

- All efforts should be part of a wider data collection strategy
- Consistency and comparability
- Partnerships at all levels
Thank you