



EU Meeting on Food Loss Measurement

Experiences and recommendations for quantifying food losses and waste from primary production



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Food and Agriculture
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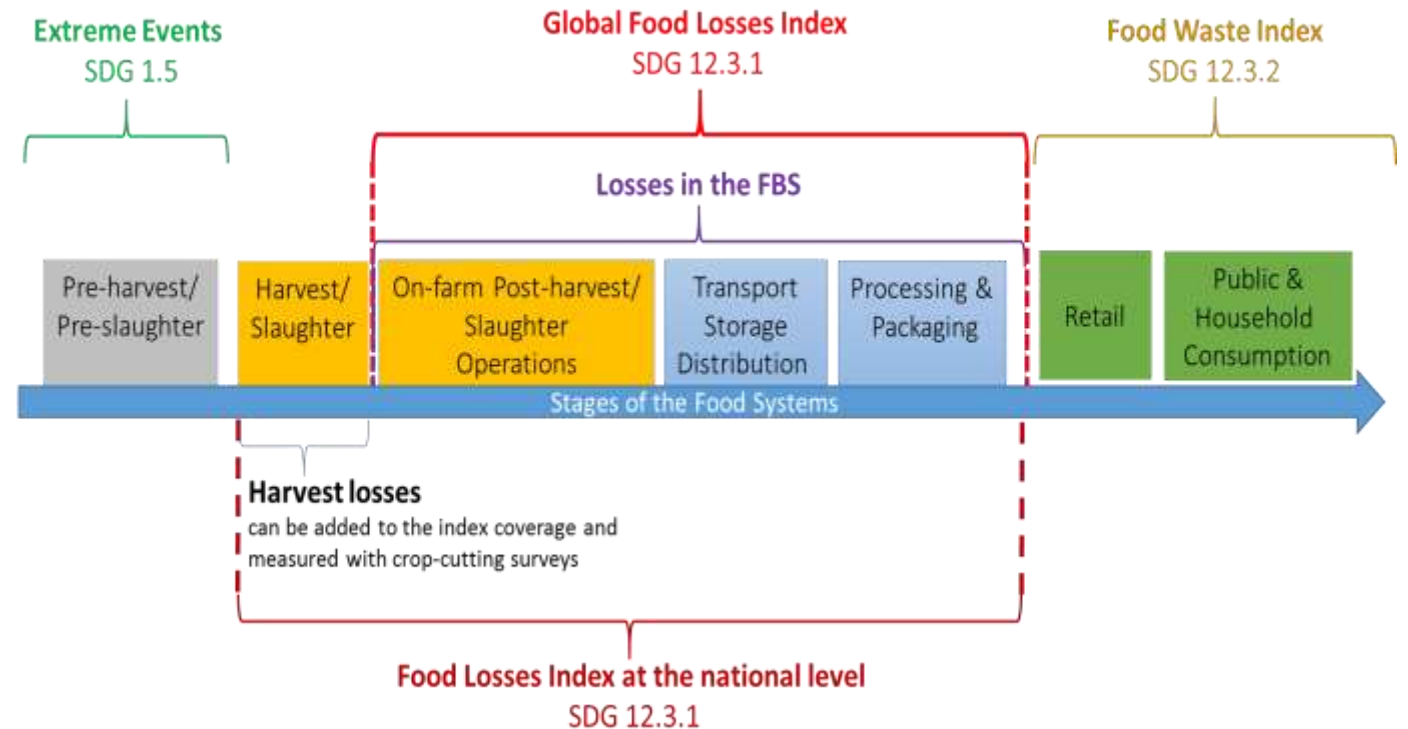
Food Loss Indices under SDG 12.3.1



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

Steps to compiling the Index if the data exists:

1. Select Basket of 10 key commodities and compile weights
2. Compile Food Loss Percentages
3. Compare Food Losses over time



Building the FLI- Food Loss Percentages (FLP)

Food Loss Percentage (FLP) of a country is the average percentage losses of key items:

$$FLP_{it} = \frac{\sum_j l_{ijt} * (q_0 * p_0)}{\sum_j (q_0 * p_0)} = \text{average loss (\%)} \text{ for the main products}$$

- Where:
 - l_{ijt} is the loss percentage (estimated or observed)
 - Country = i, year = t, commodity = j
 - 0 is the base year
 - q_0 is the production quantities by country, commodity in the base period
 - p_0 is the international price by commodity (at international \$)
- **A country's Food Loss Percentage can be interpreted as the average percentage of supply that does not reach the retail stage.**

Definitions

Food Loss in agricultural statistics (FBS)

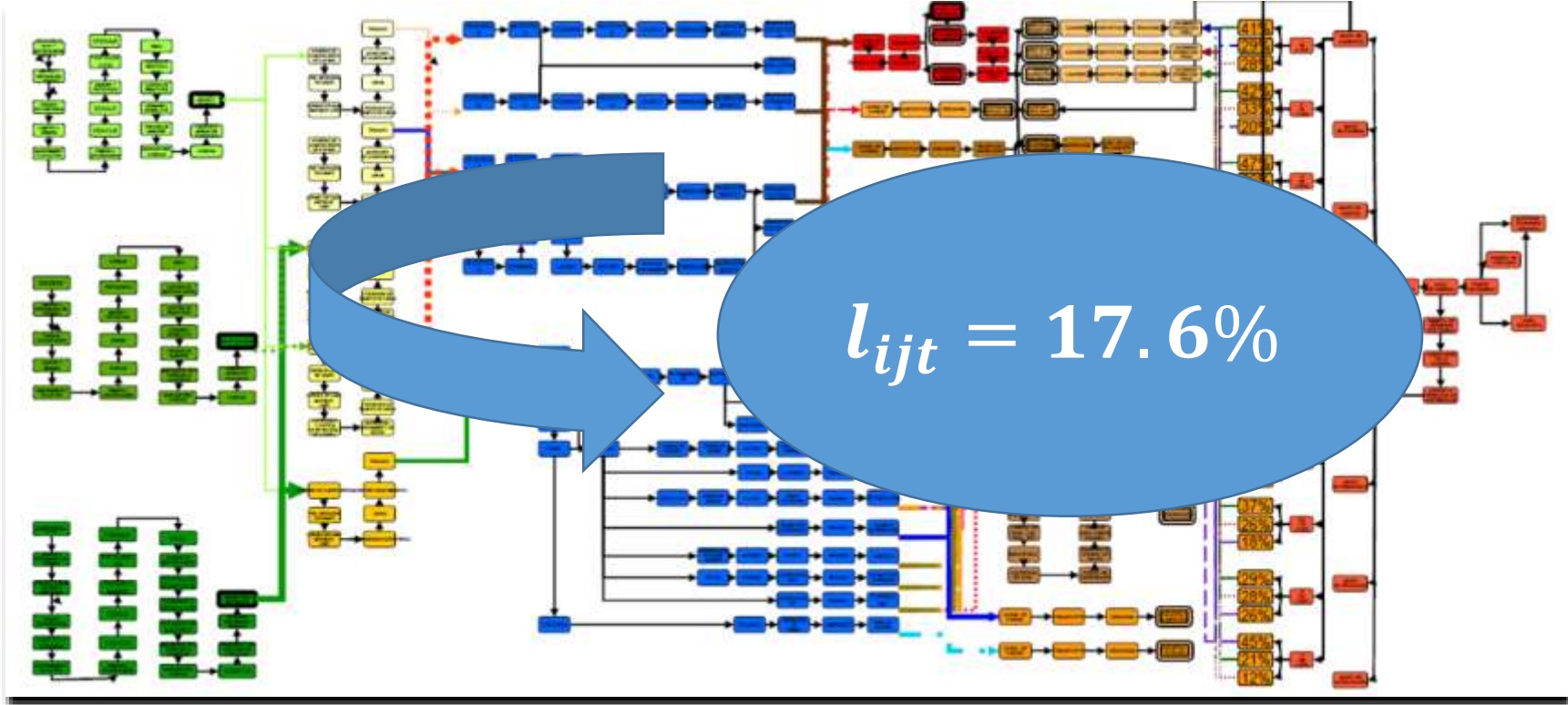
- Food Losses Crop and livestock product losses cover *all quantity losses* along the supply chain for all utilizations (food, feed, seed, industrial, other), up to the retail/consumption level. Losses of the commodity as a whole (including edible and non-edible parts) and losses, direct or indirect, that occur during storage, transportation and processing, also of relevant imported quantities, are therefore all included.
- **Important to keep consistency in what is being measured. Otherwise there will be comparability issues later.**

Comparing FLI and EU Definitions of food losses and food waste

- FAO
 - Losses = quantities that leave the supply chain for any reason
 - Includes inedible parts
 - Excludes: pre-harvest losses, feed, industrial utilizations
 - Includes milk (implicitly includes wine juices beer etc.)
 - No reference to intentionality in the definition
- EU
 - Waste = food that has become waste or food that leaves the supply (FUSIONS manual=
 - Includes inedible parts
 - Excludes: pre-harvest losses, feed, industrial utilizations
 - Includes milk and beverages
 - No reference to intentionality in the definition

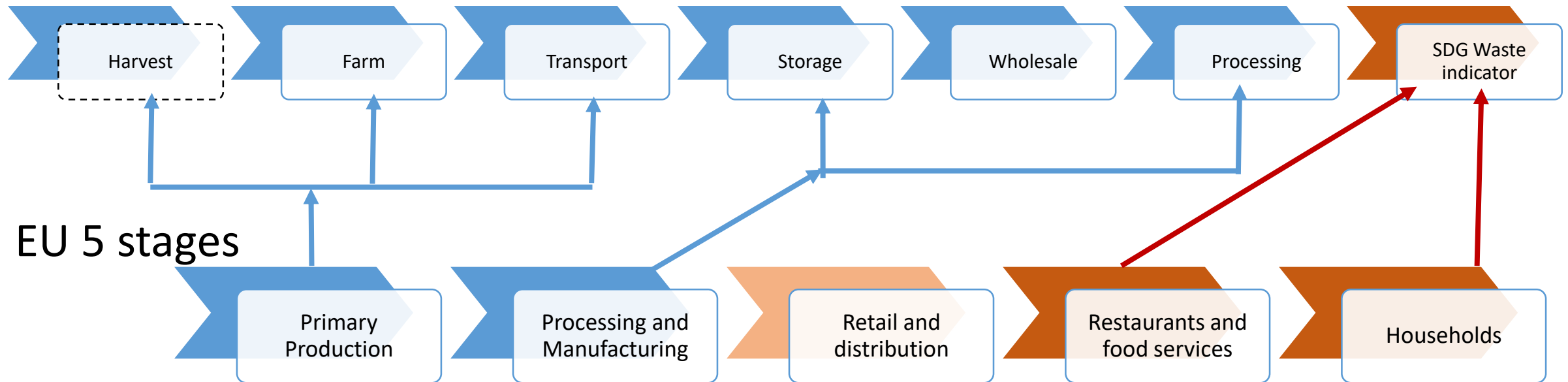
Supply Chain –Broad picture

- FAO Needs a single nationally representative number for reporting (or a range)
- Countries need to understand the dynamics of their supply system and typologies of actors at various stages



Mapping the Supply Chain to EU Regulations & the SDG

- Break down the problem into structured parts – stages



- EU 5 stages

Importance of Measurement Where Loss Occurs

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Measurement occurs at the stage of the supply chain.

- Grading and Sorting are critical points (along all of the chain, but esp, at the farm)
- Can be a result of contracting agreements or economic decision

Result of the pilots:

Downstream participants often come to the point of production to do grading and selection before the product left the field or left the farm

- ***The Measurement Methodology includes how to capture and measure these losses***



Operational Definitions of Harvest and pre-harvest losses

Point of Maturity →

	Grains & Pulses	Fruits & Vegetables	Milk & Meat	Fish
Harvest loss	These occur during the harvesting process and may be due to shattering, mechanical damage and shedding of the grain from the ears to the ground.	Quantity of produce lost during harvesting operations. These include losses from economic conditions (crops not harvested due to low prices or contract limits)	Quantity of produce i.e. meat/milk lost during slaughtering/milking operations respectively.	Harvest loss occurs mainly due to discard in good condition juveniles and low value fish. Harvest loss is the loss at the time of catch occurring at ponds/landing centres/ boats/fishing crafts/trawlers etc.
Post-harvest losses	Any losses occurring after the separation of the product from the site of immediate growth (harvest) to the moment it reaches the consumer	Post-harvest loss can be defined as reduction in available quantity of produce which becomes unfit for human consumption i.e. the degradation in quantity of a food production from harvest to consumption.	Post-harvest loss in meat/milk can be defined as reduction in available quantity of produce i.e. meat/milk which becomes unfit for human consumption. Post-harvest sector in meat/milk includes all points in supply chain from slaughtering/milking to consumption. Post-harvest activities in meat/milk include slaughtering/milking, storage, processing, packaging, transportation and marketing.	Post-harvest losses occur immediately after the catch from ponds/landing centres/ boats/fishing crafts/trawlers etc. to various marketing channels till reaches to the consumer level due to improper handling, insufficient icing, insufficient containers used for transportation of fish, delay in transportation, physical damage and chemical changes leading spoilage making it unavailable and unacceptable for human consumption.

Recommendations by stage



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Guidelines on the measurement of harvest and postharvest losses

Grains

Published and tested



Draft Annexes on Fruits and Vegetables, Milk and Meat, Fish and products



- All along the supply chain
- No one-size-fits all (surveys, administrative data, experimental design)
- Integrated in the national statistics systems
- Partnerships with the private sector
- Strategic documents on integrating sources will be added

Measurement approaches

- No single solution, the choice depends on the:
 - Purpose of the measure: preliminary estimate for quick assessment, national figure for policy purposes, etc.
 - Resources available (financial, human, technical)
 - Prior experience in loss assessments
 - Time available, etc.
- Strategy to choose the most cost-effective statistical tool to fit the purpose
- Data collection efforts need to be prioritized and STRATEGISED:
 - Which crops?
 - Which segment of the value chain (on/off-farm, etc.)?
 - Which method for crop x segment?

Maximizing use of existing data sources

- **Partner with the institution in charge of agriculture statistics (NSO, Ministry of agriculture)**
 - Optimise cost and effort, use existing knowledge
- Use administrative data, such as
 - Registers on stakeholders, market interactions
 - Veterinary records, Transport records, etc.
- Inventory existing survey instruments covering supply chains
 - FADN, agricultural surveys, agricultural censuses
- Strategize where necessary to collect information
 - Start with expert opinion and move to measurement

Guidelines prescriptions – Farm level

- Post-harvest losses – Sample surveys
 - Relevant when there are very many small actors
 - Can be complemented by experimental design or two-stage sampling on farm practices
 - Cover all activities after the commodity is harvested on-farm
 - Sorting and Grading
 - Storage
 - Transport, etc.
- Post-harvest losses – complete enumeration
 - Large commercial farms that keep accounting records (few)

Guidelines prescriptions – At Harvest

- Harvest losses - Crop-cutting surveys
 - Measures what is spilled and damaged during harvesting
- Additional questions measure what is mature and left in the field
 - Farm waste is covered by the guidelines
 - Measured and inquiry based
- For relevant Commodities, questions on conversion factors are also included (e.g. livestock to meat ratios)

Country Experiences

Mexico:

- Data collection project started with SAGARPA but is being implemented by INEGI (agricultural survey and value chain survey)
 - Different departments of SAGARPA (food safety, transport, value chains), private sector (wholesalers, producers associations)

Namibia, Malawi:

- on-farm PHL survey as a module of the annual farm production survey. Implemented by the statistics office

Zimbabwe:

- on-farm PHL survey implemented by the Ministry of Agriculture

Pilots on the Measurement Guidelines

- In Mexico in 2018 using CAPI,
 - Questionnaires have already been programmed
 - Allows for logical validations
 - Skips unnecessary sections (allows for complexity)
 - Quicker results and GPS capabilities

Questionnaire application times from the pilot on Fruits and Vegetables

- Survey to producers (interview), average 10 to 15 minutes.
- Survey with actual measurement to producers, average 1 hour.
- Cold warehouses and wholesalers, average 2 hours, includes actual measurement.
- Retailers average 15 minutes only with survey and 30 with actual measurement.

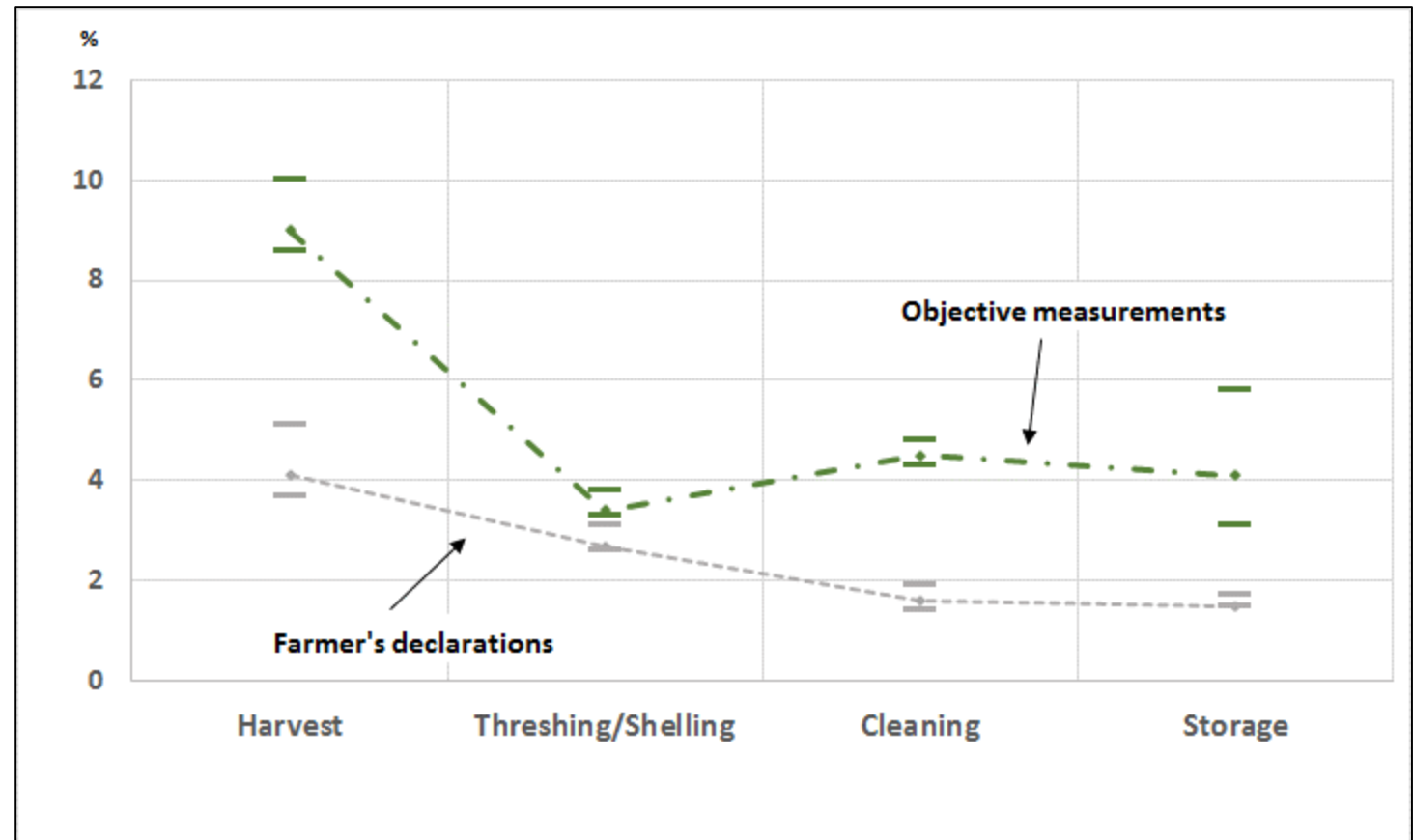


Recommendation: Benchmark inquiry based questionnaires with direct measurement

Pilots in the grains (Malawi) and In fruits and vegetables indicated that loss levels were higher when measured than when only inquiry based

The methodology covers all on-farm postharvest operations

A similar phenomenon can be observed in EU countries where reported losses (FBS) are lower than what studies suggest.



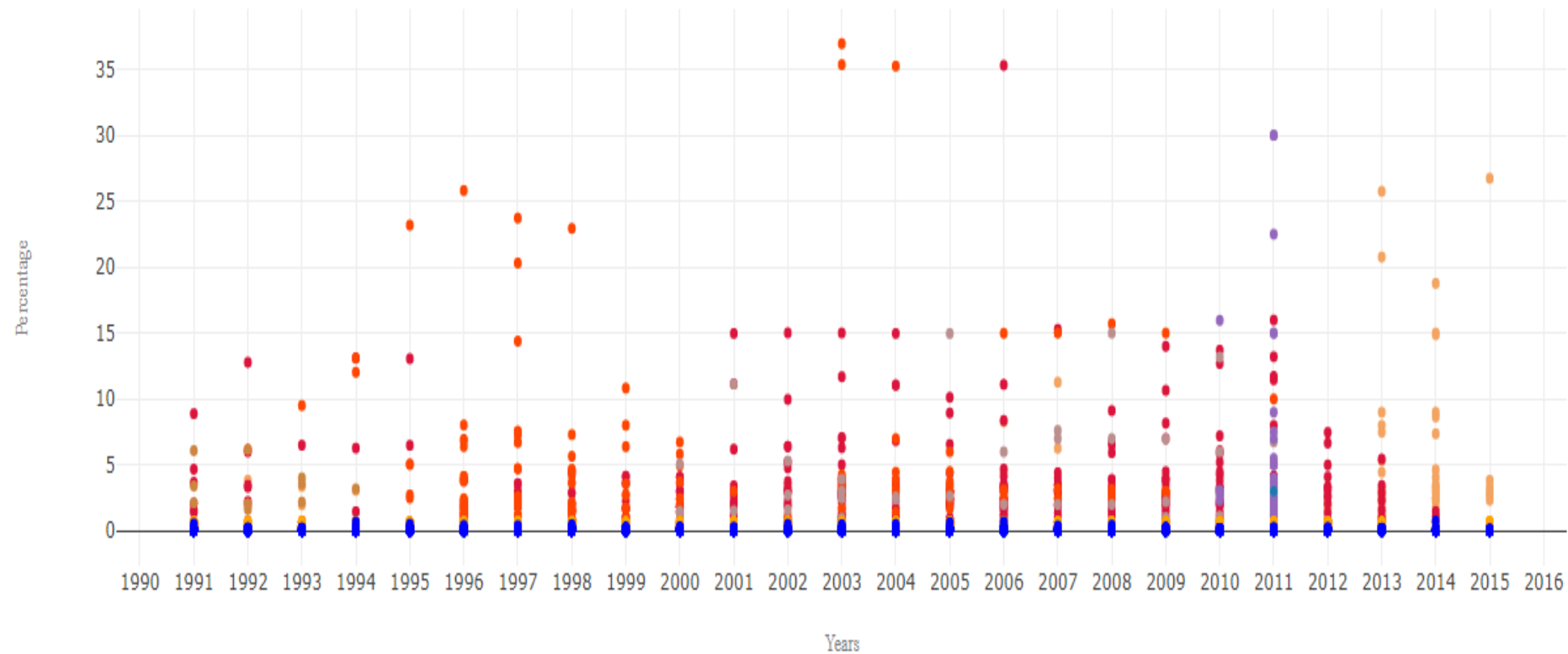
Farmer's declarations < Objective measurements

SDG 12.3 Food Losses & Waste



Differences in Reported FBS and other sources for Loss estimates in the EU

Food Loss Percentage



Blue - officially reported in the FBS

Reds - other sources

Shows an under coverage of data and likely underestimation of losses

Additional Data

For the SDG, the definition of losses include only what leaves the supply chain and is not consumed. Industrial use and feed are not counted as loss.

In the questionnaires additional questions were added for policy making above and beyond:

- Causes of losses
- Market and utilization flows
- Prices
- Weather
- Typology of actors (small scale vs export)



Guava damaged and going to juice processing



Guava damaged and is a complete loss

Data collection frequency – in country

- PHL : Baseline survey for 2-3 Years
- Survey frequency: every 5 Years
- Incorporating lower level data in the in-between years
 - Causal factors and explanatory variables to estimate losses with models

Strategy & Recommendations

- FAOs approach has focused on more **cost-effective** and simplified methods to strengthen the knowledge base through:
 - Improving data collection
 - Starting with the rapid appraisal & case study methods **and** moving to more strategic but nationally representative estimates in *critical loss points*
 - Policy can drive further disaggregation at stages (e.g. export markets vs subsistence)
 - Assess current data collection efforts and how they can be improved for loss data collection
 - Strategies and complexities by each stage are outlined in the Guidelines
 - Improve cost-effectiveness by collected and estimated with a variety of tools
 - Strengthen National estimates thru national statistics that can be consistently collected
 - Improving the predictive power of models (in years where data is not collected)

Supporting countries



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FAO Technical products on sdg 12.3.1.a

The following FAO products can be provided to all countries upon request:

- Methodological documentation for the SDG indicator 12.3.1 and the model
- Guidelines for data collection
- Training material and elearning
- An Excel calculation sheet to test the index compilation for each country and a narrative report of a pilot country
- The default basket selection
- Any available data that FAO has collected, including all loss data currently used in the model and the model-based estimates

FAO Technical Support to Countries

- Knowledge transfer on the guidelines and SDG 12.3
- Developing food loss surveys or improving food loss estimates using the Guidelines through capacity development projects
- Support pilot surveys to measure food losses in specific critical loss points or tracts of the supply chain (such as transport)
- Support in measuring the impact and cost-effectiveness of some loss reduction strategies (packaging, farming techniques, storage technology, etc..).
- Supply chain appraisals and data collection strategies



THANK YOU

contact us!

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For more detailed information on indicator 12.3.1.a please see:

<http://www.fao.org/sustainable-development-goals/indicators/1231/en/>

