New Data Efforts

FAO Workshop on: Monitoring SDG 12.3.1 Global Food Loss Index
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Outline

• New Data Collection: Surveys
  • Importance of administrative data
  • Sampling frames and representativeness
  • What to do if there are different types of sampling for each instrument
  • Using Sample Weights to get to a National Number
  • Guidelines for measurement

• New Data Collection:
  • Experimental Designs
  • Modeling (briefly)
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.)?

Guidelines for tools to use in new data collection

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

Modelling
Measurement methods: objective vs subjective

Farmer's declarations < Objective measurements
Guidelines on Measurement

- Grains & Pulses; Fruits & Vegetables; Milk and Meat Products; Fish and Fish Products
Supply Chain coverage by the Guidelines

- Nationally Representative Loss Estimates

- Where does the information come from
  - How to think about layering information to keep this cost-effective
  - Cost-effective measurement guidelines
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
Data collection frequency – in country

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

• The sample surveys are accompanied by listing surveys (also in CAPI) to create the sampling frame.

• These listings can come from the Agricultural Census, Industry Records or Organizations.

• Each listing should have the characteristics needed for stratifying the sample (e.g. size of production, geographic location, practices, etc.)

• For experimental designs, administrative data is used to extrapolate the results to the wider population.
Global Strategy Guidelines for Grains

The guidelines and on-line training are now available on the Global Strategy website, [www.gsars.org](http://www.gsars.org)

**Training Course on Post-Harvest Losses – English**
Guidelines for Other Products

- Includes how to do sampling for all the stages: On- and Off- Farm markets, including in Transportation, Storage, Packaging and Wholesale (and Retail)
- Includes definitions, boundaries, delineation of a basic supply chain, sampling framework (including sample units, strata, weighting methods) and basic questionnaires to build on to with the rapid assessment
Each commodity that is selected will have a set of questions related to the various stages and activities that are performed on and off-farm.

There are two sets of questionnaires – inquiry and actual measurement.

And the structure can be:
1) Each activity + loss within each
2) All Activities and then the section on losses – this structure allows for a single module on losses.
Option 1) With activities + Losses

The first part of each section has the common practices to be asked and then the second part has questions directly related to the loss quantities and the causes of losses.

These sections need to be adjusted for the local practices and causes that have come from the rapid appraisal.
Option 2) All the activities are asked and then the section on losses

In this option, the entity may not delineate a specific quantity to any activity but understand the total loss – in this case the activities that are selected will be prompted with a question on loss % by activity.
Minimum Set of Loss Questions

- Based on the experiences in the pilots there are a minimum set of loss questions needed.
- These include:
  - Causes of losses
  - The total volume of loss (in standard or non-standard units)
  - The connection of the total volume to different activities
  - The total volume related to grading standards (currently piloting to capture qualitative loss)
  - Questions specifically related to harvest & price/economic effects
Market Transactions

• The Flow of commodities is also critical for assessing the potential of “economic” losses.

• In this section there are questions on the quantities that go to different end destinations, how much of different grades were sold and prices related to each grade.

• In countries where there are no standard grades, the quantities and prices are only connected to end destination.
In the actual measurement section

Only a sub sample of those entities surveyed will have this section completed.

In this section scales are needed for the enumerators to measure the actual weight in the activity and the amount that would have been discarded.
CAPI Surveys

• In both cases, the CAPI instrument can be configured so that only the relevant stages/commodities appear to the enumerators.
• The CAPI surveys are structured so that the structure of the questionnaire is the same across countries but that the options can change relative to the local situation.
• Allows for uniformity in the surveys across commodities with most of the changes and validation done through programming constraints.
• In the field validation of the data is possible.
Guidelines for Other Products

• Each commodity is different in terms of market structure and how sampling will need to be stratified.

• For example, meat has a geographic sampling unit that is more relevant than potentially what can be gained by delineating by village

• Some stages may not be relevant for each commodity

Grains (cereals and pulses)
Fruits and Vegetables
   Orchards/Tree crops
   Horticulture Crops
Animal and Animal products
   Milk
   Meat (at the point of slaughter)
   Eggs
Fish and Fish Products
   Aquaculture and Open Water Fisheries
Pilots on the Measurement Guidelines

• Need to use a base set of questions
  • Tailoring in options needs to be done for relevance in the country
  • Include sections on different types of operations (harvest, storage, transport, market)
  • Expansion to relevant stages for the country
  • Causes that are useful to track widely

• Capacity Building is needed
  • to make sure that the common definition of losses is applied
  • Losses are measured where they occur and causes are collected with the quantities (e.g. 6 tons of bananas were lost at the farm because the supplier sorted out the ones that couldn’t be sold at the farm)
  • Address different types of complexities in the value chain and how/where to collect the information

• Secondary data maybe needed
  • In the survey we have dates and GPS – which means that weather can be added later
  • Pre-arrangement with some farms may improve outcomes
Pilots on the Measurement Guidelines

• Recommend to use CAPI
  • Allows for logical validations
  • Skips unnecessary sections
  • Quicker results and GPS, photo, calculation capabilities

Questionnaire application times from the pilot on Fruits and Vegetables
• Survey to producers (without actual measurement), 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.
Food Loss Measurement challenge – country differences

Storage

Transport

Waste? Losses
Recommendations by stage
Guidelines prescriptions – At Harvest

• Harvest losses - Crop-cutting surveys
  • Different yield, different definition of production

• Questions are included to measure what is mature and left in the field
  • Measured and inquiry based
  • Data can be included outside of the Agricultural Production Questionnaires

• For relevant Commodities, questions on conversion factors are also included (e.g. livestock to meat ratios)
Guidelines prescriptions – Farm level

• Post-harvest losses – Sample surveys
  • Relevant when there are very many small actors
  • May cover on-farm storage, on farm transportation
  • 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 – Storage level

Losses and quantities stored:

• Model or experimental design
  • Inventory of storage facilities with their characteristics
  • Controlled experiment of the various products, length and storage conditions

• Business records data
  • Very large storage facilities
  • Accurate accounts and records

• Farm sample survey
  • Smallholder farms (large population, small quantities)

Auxiliary data - Administrative data

• Weather at harvest
• Monthly Prices
Guidelines prescriptions – transport

• Sample survey of the trucks: Losses and quantities
  • Measuring a sample of product at destination
  • Consider indirect sampling
• Partnership with the transport companies
Guidelines prescriptions – Wholesale markets

• Agreement with the private sector
  • Quantities sold through the market, discarded product
• Sample or retailers in the wholesale markets
Guidelines prescriptions - Processing

• Agreement with the private sector
  • Companies accounting records
  • Complete enumeration or experimental design or sample survey

• Data can also come from the industrial processing questionnaires if available in country
Open issues

• Accounting for conversion factors during processing:
  • Partnership with the private sector (formal businesses)
  • Sample survey in informal businesses (oil crushing)

• Accounting for weight loss of moisture content:
  • Treated in the guidelines

• Compiling loss percentages of imported & export goods
  • Entry point: wholesale market
  • Need clarification on how to incorporate imported goods in the denominator
Other Tools for Estimation

Experimental Design
Modeling
Guidelines for tools to use in data collection

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Experimental Designs

• Used to compare the losses occurring with traditional and improved agronomic practices

• May be conducted for:
  • Equipment testing
  • Storage simulation at research stations
  • Evaluation of post-production practices effects on the level of losses at farm level

• Very important to pay attention to have the basic structure of an experiment:
  • The treatments included in the study
  • The experimental units included in the study
  • The rules and procedures used to assign treatments to experimental units (or vice versa)
  • The measurements made on the experimental units after treatments have been administered
Administrative Data & Experimental Designs

- Information on Agricultural holdings
- Machinery, equipment and assets – Module from the Integrated System
  - Provides an estimate of how many holdings are using a specific agronomic method
- Experimental Design for losses for a given type of machinery

Specific examples can be found in the Global Strategy Guidelines on the measurement of post-production losses
Representability and Scalability

• One of the key areas is how to move from survey estimates, field trials/experimental designs to national numbers
  • In the case of survey estimates, how the survey frame was constructed will give the appropriate weights to multiply estimates by the statistical units up to the higher level estimates.
    • Assess the appropriate selection of sampling units based on stage and the strata defined by the administrative data and objectives of the instrument.
  • In the case of experimental designs (e.g. manual harvest vs. mechanical) will depend on the administrative data available on how many firms/actors are using that farm/stage practice.
    • Links to administrative data