

ASIA AND PACIFIC COMMISSION ON AGRICULTURAL STATISTICS

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Agenda Item 9.2

MASTER SAMPLING FRAME FOR AGRICULTURAL STATISTICS

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Outlines of the presentation

- Concept of Master Sampling Frame and its benefits
- Recommended Frame Items by WCA 2020 & Data Sources to build MSF
- Requirements and Steps to build MSF
- Country experiences and Lessons learned
- Way Forward

Introduction

- There are two elements that are paramount to the success of a survey for which one should take the most care are the ***sampling frame and fieldwork***
- **Sampling frame:** the set of source materials from which the sample is selected (UN, 2015)
- In the surveys, faulty sampling frames are a common source of *non sampling* error, particularly under-coverage of important sub-groups

Types of Sampling Frames

- **List frame:** exhaustive list of units in the survey population (e.g. a list of all agricultural holdings, a list of major producers etc.)
- **Area frame:** set of geographical units which may be either points or segments of land
- **Multiple sampling frame:** created from a joint use of two or more sampling frames.

Combination of

- i) lists frames (List of maize producers & list of cash crop (coffee) producers) or
- ii) an area and list frame(s) (maps of EA & list of commercial holdings)

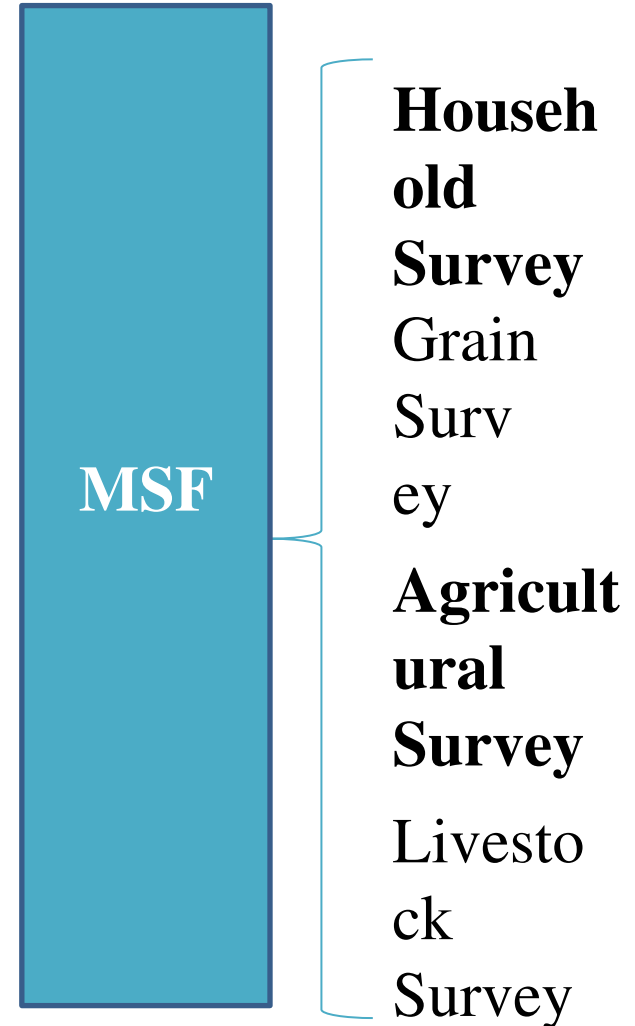
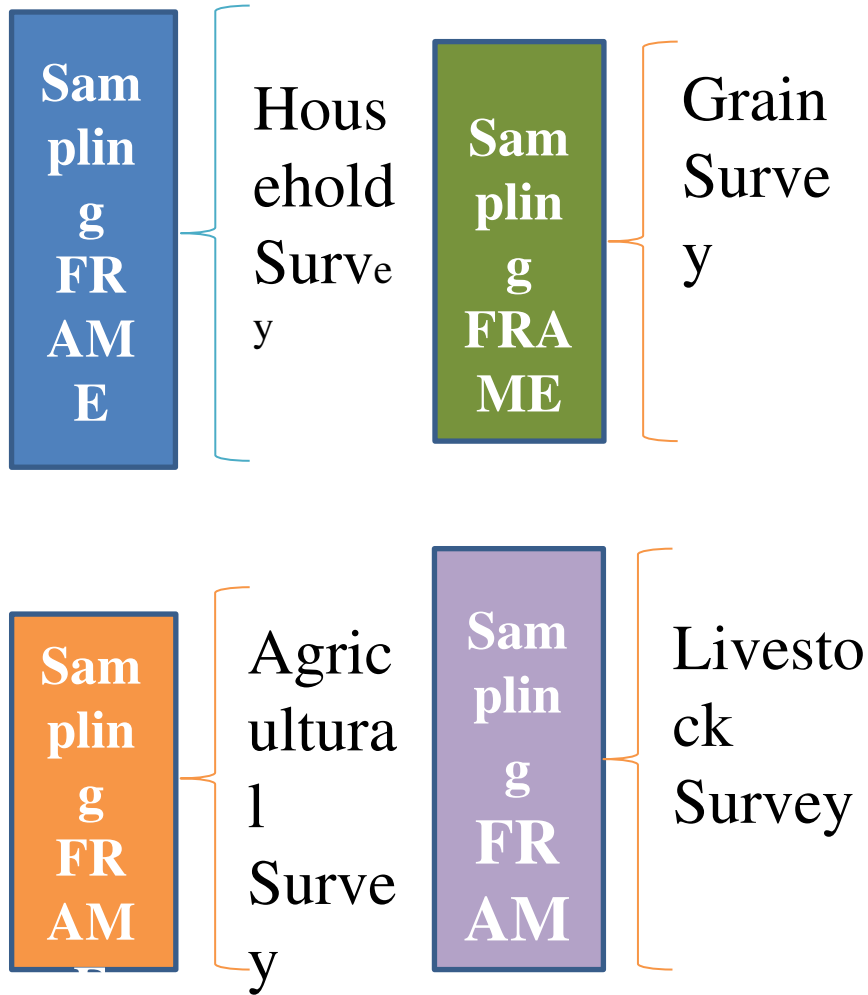
Definition

A **Master Sampling Frame** is a sampling frame that provides the basis for all data collections through sample surveys and censuses in a certain sector, allowing to select samples for several different surveys or different rounds of the same survey, as opposed to building an ad-hoc sampling frame for each survey

Traditional approach

vs

Approach suggested by MSF



What is a Master Sampling Frame for agriculture?

“MSF is a frame or a combination of frames that covers the population of interest in its entirety, and that enables the linkage of the farm as an economic unit to the household as a social unit, and both of these to the parcel of land as an environmental unit.”

Benefits of constructing and using an MSF

- MSF has several benefits.
 - is quick and easy to conduct follow up surveys because a ready-made frame is available
 - The use of the MSF can make it possible to pool the resources of several surveys
 - MSF makes easier to integrate data from different surveys and it reduces the respondents fatigue
 - MSF is an effective tool for implementation of integrated census/survey programme

Recommended Frame Items by WCA 2020

- Main items
 - Identification and location of agricultural holding; Main purpose of production of the holding;
 - Other economic activities of the HH; Total area of holding;
 - Use of irrigation; Type of temporary and permanent crops;
 - Number of animals; Presence of aquaculture;
 - Presence of woodland; ,Engagement of HH members in fishing activities etc.
- Since the coverage of MSF is wide, it should be developed keeping in mind, the data collected will be

Data Sources to build an MSF

- Examples of List frames used to build an MSF
 - List frame based on an agricultural census
 - List Frame based on population census (e.g. *Population and Housing Census with an agricultural module*)
 - List frame based on business registers of farms
- Examples of Areas frames used to build an MSF
 - Geo-referenced agricultural census or population census enumeration areas (EAs)
 - Land cover maps with boundary information and satellites images of the entire country
- Examples of Multiple frames used to build an MSF
 - Combinations of the above

Various frames used to build an MSF have their own advantages and disadvantages

Requirements for setting up an MSF

- Before establishing the MSF, one needs to determine and define the scope of an MSF
 - **Determining the data needed** from consultations with policymakers and other stakeholders. The Minimum Set of Core Data may be a starting point, and country can tailor it to suit their own needs
 - **Define precisely**, for each selected data item
 - The **coverage** at which the estimates are required
 - The accepted **level of accuracy/tolerance**
 - **Periodicity** at which the data is needed
 - **Scope** whether household plots should also be included

Steps in the construction of an MSF

- For practical issues, 8 steps have been developed to guide the implementation of MSF
- These steps are not prescriptive, however they will help to guide the team in charge of this task

8 steps to identify the suitable frame



1. Conduct

A thorough review of the statistical methods and operations, including censuses and surveys, used for agriculture in the country.



2. Review

Other censuses and surveys in the country with a focus on sampling frames.



3. Review

Administrative data and other possible sources building and/or updating a list farms or agricultural holders.



4. Obtain

Information on census or survey systems in countries of similar size, form of agriculture and capabilities.

8 steps to identify the suitable frame



5. Benchmark

To other countries with similar methods, operations and data sources to build off their experiences in implementing an MSF



6 Obtain

Background information on the country's requirements for data on agriculture



7. Identify

Overlaps in the statistical systems where resources can be combined to build an MSF



8. Determine

The requirements for geo-referencing agricultural and/or population census EAs. Identify how this can assist other parties in the national statistical system

Steps in the construction of an MSF

- The final choice of MSF should consider the costs of frame development and also costs required for maintenance and updation.
- The best time to start construction of an MSF is with the **agricultural census** because
 - ✓ Lists from an agricultural census provide excellent auxiliary information for the sampling design purposes
 - ✓ Better account can be taken of rare items or geographically concentrated activities
 - ✓ It covers both the household and non household farms

Country experiences: Ethiopia

In an effort to improve the quality and availability of its agricultural statistics, **Ethiopia** has followed two different approaches in building MSF:

Use of list frames and area frame approach

Ethiopia's MSF based on a list frame approach consists a *multiple frame sampling* formed by:

- A **frame of EAs** with the number of households compiled by using a **listing questionnaire** at the beginning of the Population and Housing Census (Household Sector)
- A **frame of large-scale commercial farms** (Non HH Sector) compiled and updated every year through administrative sources

Other countries experiences to build MSF

- **BRAZIL:** Use of list frame and area frame to build a Master Sampling Frame.
- **CHINA:** Use of area frame to build a master sampling frame.
- **EU MARS PROJECT:** Use of square segments to build an area frame for agricultural surveys.
- **EUROSTAT LAND USE AND COVER SURVEY (LUCAS):** Use of point frame to build an area frame for agricultural surveys
- **GUATEMALA:** Building an area sampling frame for agricultural surveys
- **THE UNITED STATES:** Use of area frame for agricultural surveys

More details on these available in the [Handbook on Master Sampling Frames for Agricultural Statistics](#) (Global strategy, 2015)

Countries' experiences: Lessons learned

- Countries follow a variety of practices in building sampling frames for agriculture and using these frames as an MSF
- The choice mainly depends on countries agricultural statistics issues but also on resources available
- Several countries use Population and Housing Census and/or Agricultural Census as source of data for building MSF
- Major issue mentioned in all country experiences using list frames as MSF is its rapid obsolescence and the need to develop some way for maintaining and updating the list between Census cycles. List Frames also prone to under coverage.
- Area frames as MSF is, requirement of clear satellite imagery and Land cover classification, expensive. Appropriate software and skills for interpretation are also needed.

Way forward

APCAS members are invited to deliberate on ways to

- Develop Master Sampling Frame for collecting Agricultural Statistics
- ✓ As it has several benefits being a general purpose sampling frame; and
- ✓ Agriculture census is a good opportunity to build an MSF

Thank you

Contact us

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