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MASTER SAMPLING FRAME (MSF)
for Agricultural Statistics

Use of administrative data for building and maintaining MSF

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Outline

1. Why is a MSF needed?

2. What approaches and strategies for building a MSF?

3. Using List Frame based on Business Registers of Farms to build a MSF

4. Main issues in using BRF to build MSF

5. Maintaining and updating MSF

6. Country examples
Why a MSF is needed?

• Better coherence and data integration in NSS.
  – Avoid duplication of efforts, ensure better coherence
  – Stable reference system for agricultural surveys over time,
  – Connect various aspects of the sector and a better understanding of the sector.

• Cost effectiveness. The costs of building the MSF and selecting units will be shared by all the surveys and use of modern technologies and various sources can reduce cost

• Better planning and coordination. Facilitates the planning and coordination of regular surveys in an integrated survey program and an effective tool for implementation of SPARS and foundation for AGRIS.
What approaches and Strategies for building a MSF for Ag.Stat?

Three approaches to build a MSF, depending on country context:

(i) LIST FRAMES (based on Population Census and/or Agricultural Census and/or Business Registers of Farms etc)

(ii) AREA FRAME (based on Remote Sensing, Aerial Photos, cartographic maps etc.)

(iii) MULTIPLE FRAMES combining LF and AF.

This presentation will discuss mainly the use of Business Registers of farms for building a MSF.
Sampling frame for agricultural statistics: *a listing of the units from which the sample is to be selected at any stage of sampling.*

The quality of the frame depends on how well it covers all target population units.

FAO WCA distinguishes two categories of agricultural holdings:

(i) holdings in the household sector and
(ii) holdings in the non-household sector.
A distinctive feature of agriculture in developing and developed countries is the respective importance of these two categories in the agriculture sector:

– In developed countries, the non-household sector tends to be the most important,
– In most developing countries, it is the contrary: the household sector is the most important sector and the number of non-household holdings is comparatively smaller.

Information on both the household and non-household sectors is needed
• Large variety of types of units in the non household sector in most developing countries: *large corporations, government operated holdings, cooperatives, large plantations, large livestock units etc.*

• No standard method for approaching all these very diverse units and obtaining a perfect list: all relevant registers should be considered for building a master list of all holdings in the non household sector.

• When the available information from censuses cannot provide accurate registers of farms in the non-household sector, other sources of information must be found to identify these units and complement the household based holdings

• This may include:
  − administrative registers of corporations operating agricultural holdings (business registration/licensing),
  − land registration/cadastral records
  − lists of Agricultural Cooperative members,
  − list of members of Farmers’ Associations or special Commodity Boards (Coffee, Cocoa, tea etc.).
  − local knowledge and information from extension agents and local authorities
• In some of the developed countries, particularly in Nordic Countries, Farm Registers play an important role in agricultural statistics.

• Anders and Wallgreen: how to create farm registers from administrative registers that can be used for (i) direct tabulation to provide estimates and (ii) contribute to building sampling frames for sample surveys (Benedetti et al. (2010)).

• More generally, a review on the use of administrative data to improve official statistics in developed countries identifies the following four areas:
  – Direct tabulation of statistical registers.
  – The use of administrative records to reduce cost of data collection.
  – The use of administrative records to improve estimation.
  – The use of administrative records for frame construction and sampling design.
The major issues with registers include:

**Coverage errors**

- In integrating the individual lists care should be taken to ensure that all units of interest are included and only these units are included in order to minimize under-coverage and over-coverage.

- In practice, the number of units involved in most developing countries is limited and are usually visible and well known.

- In some cases, coverage is an important issue when using frames based on farm registers:
MAIN ISSUES IN USING LIST FRAME BASED ON BUSINESS REGISTERS OF FARMS TO BUILD MSF

• For example, farmers’ associations, generally, include farmers that produce particular crops. For example: “rice producers’ farmer association” or “banana producers’ association” or “association of dairy producers”.
  – As group membership is voluntary, usually lists from such sources are not exhaustive. Other sources are required to complete the frame.
  – Advantages for building (partial) sampling frames: usually, the associations frequently update their lists and also it is easy to link the actual farm to the farmer in the list.
  – Disadvantages: their incompleteness and the need to complement them with other sources.

• When combining lists from separate sources, it must be carefully done to avoid adding duplication to the subsequent combined list.

• Generally speaking, the use of land records (cadastral registers) is preferred because they have a complete coverage of land maps (often in digital form in Geographic Information Systems (GIS)) that facilitates the identification of the piece of land where the unit is located. Ancillary information usually only refers to total area of the cadastral parcel.
Main issues in using list frame based on business registers of farms to build MSF

Missclassification errors

- Whether the frame units are accurately classified i.e. is effectively a member of the target population.

- This issue is related to the definition of the unit as adopted in agricultural censuses and surveys which can differ from the definition adopted in various registers.

- Land registry may be based on land ownership instead of holder effectively operating the holding.

- In addition, cadastral parcels are defined differently than agricultural land parcels and linking the two is sometimes difficult.

- All efforts should be made to ensure that the units in the registers correspond to the agricultural holding.
MAIN ISSUES IN USING LIST FRAME BASED ON BUSINESS REGISTERS OF FARMS TO BUILD MSF

**Duplication**

- ‘when a population unit is represented by more than one frame unit’.
- All efforts should be made to identify and reduce duplication: the master list of holdings in registers should be prepared by crossing information from various registers and by triangulation, in order to minimize these main risks and provide an acceptable complement to the frame of household sector for building a Master Frame with good coverage.
- In the case of registers from framers’ associations, the same individual may appear with different names in different lists.
- Experience shows that the matching of names from different lists is extremely difficult.

**Other issues include:**

- confidentiality (for example when tax records are used for obtaining a list of farm operators),
- quality of some sources such as records of farm operators and land operated maintained by local authorities in their areas: assessment is needed whether the source is up-to-date, complete, and possess the rules of identification as well as other desirable properties.
MAINTAINING AND UPDATING LIST FRAMES BASED ON BUSINESS REGISTERS OF FARMS

• Listings and samples of units (holdings, households, parcels, persons) should not be used over extended periods without updating or adjustment.

• The useful life of a listing can be extended by the use of suitable rules of association in conjunction with a procedure for identifying new units and deleting the disappeared units.

• If the lists come from registers, the register must have mechanisms for updating (various methods can be used depending on country situation)
Well-developed registers exist in the majority of European countries where there are well established norms to ensure the updating of the registers.

Mandatory registration for receiving subsidies or other government benefits and governmental offices keep a precise record of active holders obliged to pay taxes and holders immediately notify the stoppage in order to not be taxed.

This updated list of agricultural holders allows having up-to-date frames not only for sampling purposes but also for census taking.

The maintenance of those registers is not a big issue for statistical offices and its cost in some way is distributed among different government instances.

The problem with many of the existing registers in developing countries is that whilst they easily incorporate new units to the register, they are not so efficient in the detection of units that ceased operations.
ETHIOPIA:

• For large scale farms, commercial frame is compiled.

• Farms classified as commercial are state farms, private commercial farms, cooperative farms and enterprise farms.

• This frame is updated every year as follows:
  – The list of farms from previous year is sent to the branch offices to check if they are still operational.
  – The branch offices verify whether the list of commercial farms are still operational or not by checking on the ground.
  – The branch offices also cross check with the investment offices if there are any new commercial farms.
COUNTRY EXAMPLES

NETHERLANDS:

- Farmers have to register by law and the administrative farm register (AFR) of the Ministry of Economic Affairs, Agriculture and Innovation contains names, addresses and other characteristics of holders or holdings and a unique registration number.

- The agricultural census applies higher threshold than the AFR, thus only agricultural holdings meeting the definition of a holding in the agricultural census and above the threshold are taken into account. This threshold is applied to separate professional from hobby farmers, and to minimise processing burden.

- Information on the census items existing in the AFR is taken directly from the register for the whole census population.
SLOVENIA:
• The Statistical Farm Register was established after the AC 2000 in order to have a stable sampling frame for all agricultural surveys.
• It has been operational since 2004 and the register is updated twice a year (February/September),
• This enables the statistical office to have an updated sampling frame for the sample surveys in June and December.
• Results from all statistical surveys as well as IACS data are used for updating the register.
• All the addresses of the holdings were updated using the Register of Territorial Units.
For more information

- Global Strategy to improve Agricultural and Rural Statistics. 2010. UNSD, World Bank, FAO.


- World Programme for Census of Agriculture 2020, FAO, 2015

See: http://www.gsars.org
Thank You