AN OVERVIEW OF AGRICULTURAL STATISTICAL SYSTEMS IN THE SELECTED COUNTRIES

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1. INTRODUCTION

Agriculture plays a crucial role in the economy of developing countries, and provides the main source of food, income and employment for their rural populations. Improvements in agriculture and land use are fundamental to achieving food security, poverty alleviation and overall sustainable development.

The principal tasks involved in agricultural statistics are the collection, processing, and analyses of statistical data that characterize the current status and development of agriculture and the fulfillment of production plans. Such data are used to develop annual and long-term plans for agricultural production.

Agricultural statistics:
- are of prime importance for agricultural industry,
- are an integral component of national statistical systems,
- are important in designing development policies in the agricultural sector and the national economy.
- ascertain the crop production, crop yield, qualities of crop produced,
- furnish information about different operations and different methods which can be adopted for improving crop output,
- help to compare the different yields of crops and quality check of crops.

Statistical needs for agricultural planning and policy-making are very broad. The primary need is for current agricultural statistics produced on a regular basis, such as crop and livestock production, and most countries have established an ongoing system for the collection of these data. The sources of information in agricultural statistics are censuses, sample surveys, and the periodic and annual reports submitted by regional offices, and cooperatives, agricultural enterprises, reports based on the data obtained from basic bookkeeping procedures and production accounting at farms.

Current agricultural statistics are needed to monitor current agricultural and food supply conditions and to provide information to help governments and others in short-term decision-making (FAO).

A census of agriculture involves the collection of data at the individual holding level. Many countries compile agricultural statistics based on reports from local officials because they do not have the resources to collect data directly from farmers in sample surveys. This method of data collection is cheap and easy, but data quality often suffers because of poor reporting and the lack of sound statistical concepts and procedures. In these circumstances, a census of agriculture can be invaluable to providing a statistically sound source of agricultural statistics (FAO).

A census of agriculture is capable of producing a wider range of data than can be produced from administrative reporting. In an administrative reporting system, aggregated data are usually forwarded up through the various administrative levels. This means that, in a crop reporting system, for example, the only data available would be province or district crop area totals. In an agricultural census, data are collected and processed at the holding level. As well as getting data on the total area of crops planted, for example, an agricultural census can show the number of holdings with each crop, the distribution of crop area, and the average crop area planted, as well as cross-
tabulations with other items, such as area planted classified by household size. An agricultural census can also provide data for specific geographic areas, even non-standard groupings. These aspects greatly enhance the usefulness of agricultural census data (FAO).

2. COVERAGE OF AGRICULTURAL STATISTICS

The agriculture sector is mainly divided into the following four sub-sectors:
1) Crops
2) Livestock
3) Fishery (Aquaculture)
4) Forestry (Silviculture)

The agricultural sector covers activities related to:
- a) Growing crops, fruits and vegetables
- b) Harvesting and threshing
- c) Growing of trees and logging
- d) Fishing and breeding
- e) Rearing of animals and poultry
- f) Production of milk, eggs, etc.

2.1. Crops
The crops sub-sector covers the activities of growing crops, fruits and vegetables, harvesting and threshing, and the growing of trees and logging.

2.2. Livestock
The livestock sub-sector includes the value of livestock products and the value of draught power. The sub-sector has been divided in to the following broad categories.
- i. Net sale of animals (for slaughtering)
- ii. Natural growth of animals
- iii. Livestock Products
  - a) Milk production
  - b) Draught power
  - c) Dung and urine
  - d) Wool and hairs
  - e) Poultry products

2.3. Fishery
The fishery sub-sector covers commercial and subsistence fishing in ocean, coastal and offshore waters and inland waters. This includes catching, tackling and gathering of fish from rivers, canals, lakes, fish farms, ponds and inundated tracts.
2.4. **Forestry**  
The forestry sub-sector covers the activities of logging and gathering of uncultivated forest products which are classified into two groups.
   i. Major products comprising industrial wood such as timber and firewood; and
   ii. Minor products include a large number of heterogeneous items such as ephedra, grazing fodder, resin, medicinal herbs etc.

2.5. **Classification of agricultural activities**  
NACE (European Classification of Economic Activities) is the “statistical classification of economic activities in the European Community” and is the subject of legislation at the European Union level, which imposes the use of the classification uniformly within all the Member States.

It is a basic element of the international integrated system of economic classifications, which is based on classifications of the UN Statistical Commission (UNSTAT), Eurostat as well as national classifications; all of them strongly related each to the others, allowing the comparability of economic statistics produced worldwide by different institutions.

The agricultural classification of NACE is given below.
3. MASTER SAMPLING FRAME

3.1. Introduction
The development of a handbook on master sampling frames for agricultural statistics has its roots in the Global Strategy to Improve Agricultural and Rural Statistics (World Bank, 2011). The Global Strategy (GS) addressed the lack of direction regarding agricultural data requirements posed by the Millennium Development Goals and other emerging issues such as the use of food for biofuels,
food security, and the environment. These emerging issues came during a time of general decline in the overall quality and availability of agricultural statistics.

The GS also addressed a significant challenge - in most countries, agriculture is outside the national statistical system and often based on administrative data rather than statistical methodology. The GS addressed the need to consider the three dimensions of agriculture and the related farm, farm household, and land units. This need led to the GS goal of integrating agriculture into national statistical systems. The GS then laid the foundation for a master sampling frame for agricultural and rural statistics and its use in an integrated survey system.

As indicated in the GS, the development of a master sampling frame for agriculture that will be the foundation for all data collection based on sample surveys and the development of guidelines and tools that are tailored to the specific situation of each country, taking into account both the structural characteristics of the agricultural sector and the level of development of the national statistical system.

A master sampling frame is a sampling frame that provides the basis for all data collection through sample surveys and censuses in a certain sector. It is used to select samples either for multiple surveys, each with different content (as opposed to building an ad-hoc sampling frame for each survey), or for use in different rounds of a continuing or periodic survey. Two important guidelines on Master Sampling Frames (MSF) for agriculture statistics are the Handbook on Master Sampling Frames for Agricultural Statistics (published in 2015 by FAO) and the Master Sampling Frame for Fisheries and Aquaculture Statistics (on going).

3.2. The Master Sampling Frame in the Agricultural Sector

The challenge in developing sampling frames for agriculture is that they must reflect three different statistical units: the farm or agricultural holding, the farm or rural household, and the land the holdings and households use and occupy. Specific frames can be used for targeting each type of sampling unit, with specific surveys being carried out separately (agricultural surveys, household surveys, and farm management surveys). However, if a single frame can be employed, can save effort and improve the efficiency for designing samples. A frame that allows for selecting different survey samples and accounting for different types of sampling units, is called a Master Sampling Frame (MSF). In agriculture, the three units (farm, household, and the land) must be linked so that household income, health and other measures may be compared to the farm’s economic situation; and their impact on the environment and land use. Often there is a relationship between the agricultural holding, the household, and the land parcel making it easy to collect economic, social, and land use information from a single statistical unit. If these units are geo-referenced, the three units can also be associated with land cover and the environment. A challenge facing the development of MSFs occurs when there is not a consistent one-to-one link between the agricultural holding and the household. A challenge facing the development of MSF occurs when there is not always a one-to-one link between the agricultural holding and the household. Therefore, one of the basic principles underlying the MSF is to employ geo-referencing methods for all statistical units.
Another principle is that there must be a careful linkage of the sampling units to reporting units so that there is complete coverage of the populations of interest, as well as a linking of the agricultural holding to the household and land dimensions. This listing of sampling units may consist of a list of the names of farm operators obtained through an agricultural census, of households from the population census, a list of commercial agricultural enterprises that are not associated with a household, or a list of area units defined geographically.

In order to capture the linkage between the dimensions of agriculture, the vision begins by defining how satellite imagery of the country’s land mass be obtained that provides land cover by broad classifications. The vision continues by geo-referencing the Enumeration Areas from the population and agricultural censuses. Administrative areas such as villages, counties, etc., should also be geo-referenced. This would enable a better coordination of the difference censuses and other data collection efforts.

The basic concepts underlying sampling frame choices and estimation are defined, include defining the target population, subpopulations, the sampled population, variables of interest, the sampling unit, the observation unit, and the reporting unit. These must be carefully defined before making decisions about the MSF and associated estimators.

The units in an area sampling include points, transects (lines of a certain length), or pieces of land called segments.

Lists of farms with associated auxiliary data on size measures can be more statistically efficient for sample survey purposes than other forms of sampling. However, they rapidly become out of date and are prone to under coverage. Area frames, while complete, are more suited for measuring characteristics of small farms and commodities widely distributed in the population. Sample sizes must be large enough to control sampling variability if there are large farms in the population. Multiple frame sampling has been introduced as a method that builds off the strengths of individual frames with sampling flexibility for each frame.

Multiple frame sampling involves the joint use of two or more sample frames. For agricultural purposes, this usually involves the joint use of area and list frames. The basic principles underlying multiple frame sampling are the same as those which apply to single frame sampling. Sampling units and associated reporting units must be defined. The sampling unit for an area frame is a segment of land or a point for which a reporting unit is formed. Rules of association are used to link the area sampling unit to the reporting unit, which is the farm or a portion of the farm. The sampling unit from the list frame is the name of the farm or – as common in most developing countries – the name of the landholder or the farm operator. The reporting unit is the holding associated with the name. The joint use of both frames generates domains of estimation in a dual frame design. Based on such domains, major estimators available in the literature are reviewed and statistically introduced.

3.3. Data integration
Data integration issues in current statistical systems:
In many countries, data are collected by sector using different sampling frames and surveys. This division of data by sector does not allow for cross-sector analysis or the ability to measure the impact of actions in one sector on other sectors.

Surveys on crop production are often carried out separately from livestock production surveys, using different sampling frames. This does not allow the analysis of holdings characteristics that produce both crops and livestock or for comparing them to holdings that specialize in either crops or livestock.

Household surveys are conducted without coordination with production surveys, using different sampling frames and often with sample sizes too small for the data to inform on the rural or farm sectors. These data are also not usually combined with other data sources into a common database for access by data users.

There are usually several national organizations that have responsibility for data collection, analysis and reporting on agriculture, fishery and forestry data without coordination. The national statistical agency may collect the agricultural census while the ministry of agriculture may produce annual production data.

Data are kept separate and often produce conflicting results, which confuses issues and data users.

The main goal of the development of a MSF is an integrated Agricultural Statistics Framework in order to:

- Avoid duplication of efforts
- Reduce statistics discrepancies
- Connect various aspects of the sector
- Allow the analysis of sampling units from different viewpoints
- Have a better understanding of the sector

The MSF is one of the main tools for establishing a closer link between results from different statistical processes and statistical units.

The MSF may be cost effective when it covers several surveys. The costs of selecting the master sample units will be shared by all the surveys using the MSF. The sample selection costs per survey will thus be reduced. Much greater cost savings are realized when the costs for preparing maps and subsampling frames of holdings units within master sample units are shared by the surveys. Current technologies, in particular the availability of remote sensing and the ability of geographic information systems to overlay and integrate different layers of geographic information efficiently, have completely transformed the way of building MSFs for the agricultural sector and have considerably reduced the cost and the time needed.

3.4. Planning and coordination facilitation

The MSF also facilitates the planning and coordination of regular surveys in a survey program:

- Gain in interviewers’ recruitment;
- Reduced time for the interviewer to find the households; and,
- Reduced time for the organization and starting of surveys.
3.5. MSF building approaches

Depending on country capacity and circumstance, the GS proposes five different approaches for establishing a MSF:

1. List frame based on the population census
   - Need to identify households with agricultural holdings in population census
   - Need to add non-household holdings for a complete agricultural frame
   - While it is possible to identify household holding agricultural production activities, measures of size are nearly impossible

2. List frame based on the agricultural census:
   - Assumes complete coverage of household holdings, commercial farms and subsistence farming households
   - Must georeference land to farm headquarters or households, basically creating an area sample frame
   - Register or frame updates are necessary between censuses

3. List frame based on administrative data (e.g. business register of farms):
   - Where reliable administrative data is available, it can be used as the basis for an agricultural register
   - Need to include small household and subsistence holdings data
   - Georeference farms or households to census enumeration areas, basically creating area sample frame

4. Area frame (based on remote sensing; aerial photos, etc.):
   - Use georeferenced satellite imagery to categorize land by use
   - Add census enumeration and administrative boundary layer
   - Select areas for inclusion in samples
   - Develop register of farms

5. Mixed list and area frame (Multiple frame approach)

3.6. Main steps to building an MSF

Eight steps to identify the suitable frame are given below:

1. Conduct a thorough review of the statistical methods and operations, including censuses and surveys, used for agriculture in your country.
   - Where relevant, separate reviews should be undertaken by/for the relevant National Statistical Office and by/for the statistical unit within the Ministry of Agriculture.
   - Both the methodology used and the data provided must be reviewed.

2. Review other censuses and surveys in your country with a focus on sample frames. Examples are the population census, national household surveys, and price collections for the Consumer Price Index.

3. Review administrative data and other possible sources for building and/or updating a list of farms or agricultural holders.

4. Obtain information on census or survey systems in countries of similar size, form of agriculture, and capabilities.
5. Compare findings from steps 1, 2, 3 and 4 above with the methods described in this Handbook to find out where similar methods are used and build off their experiences.

6. Follow the guidelines on obtaining background information on your country’s requirements for data on agriculture, as described in Chapter 2 of the Handbook. This information should then be contrasted with data currently available.

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.

Following the 8 steps, there should be enough information to make a first recommendation on the choice of frame (list or area) or on a form of multiple frame sampling.

3.7. Final choice of MSF
- Seek a peer review of the frame selection process; revise as necessary.
- Begin implementation in a portion of the country.
- The final choice of MSF should take into consideration not only the costs of frame development and data collection, but also the costs required for maintenance and updating.
- The proposals should be realistic and reflect national capabilities, and include an indicative budget and timeframe for implementation.
- An effective MSF will facilitate the integration of agriculture into the national statistical system and will benefit the entire statistical system.

3.8. Limitations of MSF
- It always represents a compromise among different design requirements
- Savings will be small if Master sample cannot be extended to lower stages of sampling.
- Useful only if it is used more than once and for more than one survey
- May not be suitable for Surveys aimed at local level or unevenly distributed and rare population sub-groups

3.9. Country Experiences

Brazil
Brazilian Institute of Geography and Statistics (IBGE) initiated a National System of Agricultural Establishment Sampling Surveys with a view to also develop an MSF for agricultural surveys, using the multiple frame approach by combining census enumeration areas (EA) as the area frame and a register of farms. The MSF was designed to be based on the 2006 agricultural census, but also uses information from the 2010 population census. IBGE decided to postpone the implementation of the National System of Agricultural Surveys and wait for the next agricultural census planned for 2016. However, uncertainty regarding the date of the Agricultural Census due to budgetary concerns led IBGE to study alternative methodologies for building a MSF for implementing National System of Agricultural Surveys.

China
To build the sampling frame, the second national agricultural census for 2006, which includes an enumeration of planted crop areas, was used. The scope of these data is aligned with the basic amount of cultivated land registered as farmer’s land contract certificate (although some data are
Another source is the second national land use survey (maps), which provides geospatial data on the cropland but lacks specific crop information. The third source is remote sensing imagery; this can be processed to obtain more recent agricultural spatial information, such as planting information for the main crops. However, the accuracy of planted area estimates depends on the accuracy of crop classification.

The most basic unit of the crop area frame survey is the cultivated land area, which can be observed directly. When selecting a suitable segment size, consideration was given to the sampling variance of different segment sizes, the proportion of non-zero crop area value, survey cost, surveyors’ daily workload, accessibility of segment physical boundaries on the images, etc.

Within the target population’s spatial area, administrative boundaries are used to define village space. Crop planting area measures come mainly from the second national agricultural census, combined with the remote sensing measures and the second national land use maps data for calibration and matching. Finally, the sampling frame of administrative villages as the Primary Sampling Unit (PSU) was compiled. PSUs are selected with PPS; the auxiliary variable being cropping intensity. Within the spatial area of the sampled PSUs, the cultivated land is split or combined with the natural boundary to create the frame of segments.

A two-stage sampling method was adopted to select samples for the crop planting area. In the first stage, PSUs were stratified and the sample selected, using probabilities proportional to cultivated land. The precision requirements on major crops (total planting area of crops, grain planting area, major grain crops planting area) are expected to have Coefficients of Variation (CVs) within 5 percent. With this limit, the sample size was determined by trade-off between workload, cost and accuracy. In the second stage, within the sample village, sample segments were selected by simple random sampling. In particular, within the villages, the list of all cultivated land segments was created and ordered. The random number table was used to generate random numbers and five segments were selected as the sample. The process results in a stratified two-stage sampling design with PPS selection at the first stage and simple random section with equal probability at the second stage.

**Ethiopia**

One frame is the list of EAs with the number of households compiled directly from the census. In addition, a commercial frame of large-scale farms is compiled and updated every year. Together, these form the MSF. Thus, multiple frame sampling is used. The PSUs were selected by PPS, the size being the number of households in the PSU.

Ethiopia has also conducted pilot studies on area frame development. In the area frame approach, EAs are used as the PSU and segments of 40 hectares in size are used as SSUs. Two main inputs are used to develop the area frame: (i) enumeration area maps and (ii) land cover maps.

**Guatemala**

The National Institute of Statistics of Guatemala conducted the Fourth National Farming Census in 2003. A System of Continuous Farming Statistics was designed, starting from the construction of an Area Sampling Frame. The area frame was built using satellite images and aerial photographs. This frame was combined with a list of big farms identified by the census, to make a multiple frame
survey. The sample design was stratified two-stage sampling, with PSUs selected in the first stage and a sample of segments selected within the PSU in the second stage. This frame was used during the 2005, 2006, 2007 and 2008 surveys.

In 2013, a survey was designed to obtain accurate national estimates for priority crops in the period from May to December of that same year (area, yield and production). The survey was to cover all area used for agricultural production or that had the potential to be used for that purpose. The non-agricultural categories excluded were urban centers; educational, recreational and military facilities; jails; industrial estates; airports; shores; cemeteries; water sources, wetlands with forest and other vegetation, swamps, arid and mining areas, beaches, volcanic cones, national parks and protected areas.

United States of America

The Natural Resource Conservation Service (NRCS) and the National Agricultural Statistics Service (NASS) have each developed area sampling frames. The NASS also has a list sampling frame, which is used in the multiple frame contexts.

The NASS area frame covers all land in the US. The land is stratified by land characteristics. Segments of approximately equal size and identifiable boundaries are delineated within each stratum and designated on aerial photographs. A probability sample of segments is selected within each stratum. The main survey using this frame is conducted in June each year and obtains data on crop areas and livestock inventories. The data collection effort involves drawing the detailed boundaries of every field in each sample segment. In major producing areas, subsamples of corn, soybean, cotton and wheat fields are selected for objective measurement surveys for yield forecasts. The cropland and land use boundaries drawn on the photos are digitized and used as “ground truth” for the crop land data layers prepared using remote sensing data. The area frame is used to measure the incompleteness of the list frames that are also used by NASS.

The use of segments with identifiable boundaries affects all stages of frame development and sample selection. Satellite imagery and other topographic mapping materials are used to determine the stratum and PSU boundaries. The most permanent boundaries, such as paved roads, railroads, canals, rivers, etc are used. The area frames are expected to remain in use for 15-20 years and represent a major investment.

NASS has developed a list frame with an emphasis on including large farms, farms that produce rare items, and farm characteristics that are used for stratification or other sampling methods. For the five-year census of agriculture, NASS attempts to build a list that is as complete as possible. It then uses the area frame to account for farms that are not on the list frame.

Rwanda

Rwanda has conducted the Seasonal Agricultural Surveys (SAS) Programme based on probability sampling and estimation methods since 2013. The agricultural surveys implemented are based on Multiple Frame Agricultural Surveys (MFS) that consist of an area sample survey combined with data from a list of special farms. The MFS takes into account the country’s relative advantages and the constraints (mainly in terms of permanent specialized staff, training and resources).
Rwanda was the country’s relatively small total agricultural area. The multiple frame sampling methods applied combined a sample of segments, selected from an area frame, with a complementary short list of special farms. The multiple frame estimates combine estimates from the area sample with estimates obtained from the list of special farms.

For more information:
- Handbook on Master Sampling Frames for Agricultural Statistics (Global strategy, 2015)
- Global Strategy to Improve Agricultural and Rural Statistics (World Bank, 2011)
- Guidelines for Linking Population and Housing Censuses with Agricultural Censuses with selected country practices (FAO, UNFPA 2012)

### 4. LAND USE/COVER AREA FRAME SURVEY (LUCAS)

The European Union (EU) is composed of a diverse range of landscapes: it is home to a wide variety of flora and fauna and includes some of the most and least densely populated areas of the world. LUCAS provides harmonized and comparable statistics on land use and land cover across the whole of the EU’s territory - a total area of just under 4.5 million square kilometers (km²) for the EU-28.

Land use refers to the socioeconomic use that is made of land (for example, agriculture, commerce, residential use or recreation); at any one place, there may be multiple and alternate land uses.

Landscape refers to an area of land whose character and functions are defined by the complex and regionally-specific interaction of natural process with human activities that are driven by economic, social and environmental forces and values. Landscape can be analyzed by taking account of elements such as landscape diversity, the importance of linear features, and the degree of landscape fragmentation.

LUCAS is a harmonized in situ land cover and land use data collection exercise that extends over the whole of the EU’s territory. An in situ survey implies that data are gathered through direct observations made by surveyors on the ground. The data collected by LUCAS provides harmonized information for studying a range of socio environmental challenges, such as land take, soil degradation or biodiversity. Land cover refers to the bio-physical coverage of land (for example, natural areas, forests, buildings and roads or lakes).

LUCAS is based on statistical calculations that interpret observations in the field. It is based on a standardized survey methodology in terms of a sampling plan, classifications, data collection processes and statistical estimators that are used to obtain harmonized and unbiased estimates of land use and land cover.

LUCAS is a two phase sample survey. The LUCAS first phase sample is a systematic sample with points spaced 2 km apart in the four cardinal directions covering the whole of the EU’s territory; it therefore includes around 1.1 million different points. Each point of the first phase sample is photo-interpreted and assigned to one of the following seven pre-defined land cover strata — arable land, permanent crops, grassland, wooded areas and shrub land, bare land, artificial land, and water.

From the stratified first phase sample, a second phase sample of points (the field sample) is drawn. The stratified sample is selected independently in each Nomenclature of Territorial Units for Statistics (NUTS II) region fixing precision targets for the estimates of the main land cover classes. Each of these field samples is classified during the field visit according to the full classifications of land use and land cover.
A panel approach assures that a certain percentage of points are surveyed in successive LUCAS campaigns. Points above 1,500 meters and far from the road network are considered inaccessible and excluded from the sample to limit the cost of the data collection exercise.

The sample design is taken into account for the computation of the final estimates by calculating appropriate weights for each surveyed point. The final weights are computed taking into account two elements:

- The weight of the first phase stratification assigned to each of the seven strata (in each NUTS level 2 region) and;
- The second phase sampling weight resulting from the combination of the sampling weight needed to extrapolate what is observed in the sample to the total population, and the weight for missing data adjustment to account for points missing 'by design' (those points excluded because they are inaccessible).

The 2012 survey was based on 270,000 points/observations, which were visited by 750 field surveyors (mostly agricultural and forestry engineers); the field survey took place between March and September 2012.

LUCAS surveyors go to the points and observe the land cover, land use and environmental parameters they find on the ground. The surveyor documents the land cover and land use according to harmonized classifications. The concept of ‘land’ is extended to inland water areas (such as lakes, rivers, estuaries or lagoons). The surveyor also collects information relating to the percentage of land cover within a specific window of observation, the area size, the width of any specific features, the height of any trees, as well as information on land and water management (for example, grazing or irrigation). Surveyors receive training before going into the field: they have a set of supporting documents, instructions on how to carry out the survey, and a set of quality control procedures. They fill in a questionnaire with a series of land cover and land use parameters. They also take a series of photographs at each point, of the point itself, as well as pictures in all four cardinal directions (north, south, east and west), before walking 250 meters in an eastwards direction (a ‘transect’), recording all of the different land cover and linear elements. These linear features include elements such as walls, hedges, roads, railway lines, irrigation channels or electric power lines.

The information collected for this transect can be used to analyze the fragmentation, richness and diversity of landscapes.
### Figure 2 LUCAS — classifications of land cover

<table>
<thead>
<tr>
<th>Land cover</th>
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</thead>
<tbody>
<tr>
<td>A00</td>
<td>ARTIFICIAL LAND</td>
<td>A10</td>
<td>Built-up areas</td>
</tr>
<tr>
<td>B00</td>
<td>CROPLAND</td>
<td>B10</td>
<td>Cereals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B20</td>
<td>Root crops</td>
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<td></td>
<td></td>
<td>B30</td>
<td>Non-permanent industrial crops</td>
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<td></td>
<td></td>
<td>B40</td>
<td>Dry pulses, vegetables and flowers</td>
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<tr>
<td></td>
<td></td>
<td>B50</td>
<td>Fodder crops (mainly leguminous)</td>
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<tr>
<td></td>
<td></td>
<td>B70</td>
<td>Permanent crops: fruit trees</td>
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<td></td>
<td></td>
<td>B80</td>
<td>Other permanent crops</td>
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<tr>
<td>C00</td>
<td>WOODLAND</td>
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<td>Broad-leaved woodland</td>
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<td>Coniferous woodland</td>
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<td>Mixed woodland</td>
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<td>Shrubland with sparse tree cover</td>
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<tr>
<td></td>
<td></td>
<td>D20</td>
<td>Shrubland without tree cover</td>
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<td>GRASSLAND</td>
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<td>Grassland with sparse tree/shrub cover</td>
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<td></td>
<td>E20</td>
<td>Grassland without tree/shrub cover</td>
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<td></td>
<td></td>
<td>E30</td>
<td>Spontaneously re-vegetated surfaces</td>
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<td>F00</td>
<td>BARE LAND AND LICHENS/MOSS</td>
<td>F10</td>
<td>Rocks and stones</td>
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<td>F20</td>
<td>Sand</td>
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<td>Lichens and moss</td>
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<td>WATER AREAS</td>
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<td>Glaciers, permanent snow</td>
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<td>Coastal wetlands</td>
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### Figure 3 LUCAS — classification of land use

<table>
<thead>
<tr>
<th>Land use</th>
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<tbody>
<tr>
<td>U110 Agriculture</td>
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<tr>
<td>U120 Forestry</td>
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<tr>
<td>U130 Aquaculture and fishing</td>
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<tr>
<td>U140 Mining and quarrying</td>
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<tr>
<td>U210 Energy production</td>
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<tr>
<td>U220 Industry and manufacturing</td>
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<tr>
<td>U310 Transport, communication networks, storage, protective works</td>
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<tr>
<td>U320 Water and waste treatment</td>
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<tr>
<td>U330 Construction</td>
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<tr>
<td>U340 Commerce, finance, business</td>
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<td>U350 Community services</td>
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<td>U360 Recreation, leisure, sport</td>
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<td>U370 Residential</td>
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<tr>
<td>U400 Unused</td>
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5. AGRICULTURAL STATISTICAL SYSTEM IN THE SELECTED COUNTRIES

Data collection, analyzing and publishing of agriculture sector differs country by country. In this section some country experiences are summarized.

5.1. United States of America

The National Agricultural Statistics Service (NASS) collects, summarizes, analyzes, and publishes agricultural production and marketing data on a wide range of items, including number of farms and land in farms, acreage, yield, production, stocks of grains, and numerous commodities. The Census of Agriculture is conducted every five years to collect information on the number of farms, land use, production expenses, value of land, buildings, and farm products, farm size, characteristics of farm operators, market value of agricultural production sold, acreage of major crops, inventory of livestock and poultry, and farm irrigation practices. The last two censuses were conducted in 2012 and 2017.

Agricultural Statistics is published each year to meet the diverse need for a reliable reference book on agricultural production, supplies, consumption, facilities, costs, and returns.

Estimates for crops, livestock, and poultry made by the U.S. Department of Agriculture are prepared mainly to give timely current state and national totals and averages. They are based on data obtained from sample surveys of farmers and of people who do business with farmers. The survey data are supplemented by information from the Censuses of Agriculture taken every five years and check data from various sources. Being estimates, they are subject to revision as more data become available from commercial or government sources. Unless otherwise indicated, the totals for the United States are shown in the various tables on area, production, numbers, price, value, supplies, and disposition are based on official Department estimates. They exclude states for which no official estimates are compiled. (https://www.nass.usda.gov)

Sample area frames for agricultural surveys by NASS.
The process involves many steps, which have been developed to provide statistical and cost efficiencies information.

Some of the key steps are:
1. Stratification: The distribution of crops and livestock can vary considerably across a state in the United States. The precision of the survey estimates or statistics can be substantially improved by dividing the land in a state into homogeneous groups or strata and then optimally allocating the total sample to the strata.
2. Multi-Step Sampling: Within each stratum, the land can be divided into all the sampling units or segments and then a sample of segments selected for a survey. This would be a very time-consuming endeavor. The time spent developing and sampling a frame can be greatly reduced by: (1) dividing the land into larger sampling units called first-step or primary sampling units (PSUs), (2) selecting a sample of PSUs and then delineating the segments only for these PSUs, and (3) selecting a sample of segments from the selected PSUs.
3. Analysis: Several decisions are made that can have an appreciable impact on the statistical and cost efficiency. These include decisions such as the land-use strata definitions, the number of substrata, the size of the sampling units, the allocation of and the method of selecting the sample necessary to guide us in these decisions.

4. Quality Assurance: Care must be taken to ensure that no land is omitted from the frame (unless by design), that no land area is included more than once and that the land is properly stratified into the land-use strata. Once stratification is complete, the resulting PSUs should be reviewed to verify boundaries and proper classification of PSUs into strata. Also, a quality assurance edit should be run to identify errors such as PSUs with area outside the tolerance range and mislabeled PSUs. Catching errors using quality assurance measures will ensure that sound statistical rules are followed to reduce sampling errors and minimize non-sampling errors.

The major area frame survey conducted by NASS is the June Agricultural Survey (JAS). This mid-year survey provides area frame estimates primarily for crop acreages and livestock inventories. During the survey, the interviewers visit each segment in the sample, which has been accurately identified on aerial photography, and interview each person who operates land inside the boundaries of the selected segments. With the respondent's assistance, field boundaries are identified on the photography and the acreage and crop type reported for each field in the segment. Counts of livestock within each sample segment are also obtained. This area frame information is subsequently used to provide state, regional and national estimates for crop acreages, livestock inventories and other agricultural items. Naturally, the procedures used to develop and sample area frames affect the precision and accuracy of the survey statistics. (Area Frame Design for Agricultural Surveys, Carrie Davies, USDA, NASS, 2009.)

5.2. Germany
The European Union (EU) Farm Structure Survey (FSS) collects information on the structural characteristics of agricultural holdings (land use, livestock and labor force) and is carried out every 10 years as an agricultural census by all the EU Member States, with two or three additional, intermediate sample surveys carried out in-between. The last FSS was carried out in 2010.

Germany has been providing FSS sample data in compliance with EU regulations since 1975. Furthermore, the FSS is conducted as a census at least every ten years. In Germany, the FSS is a decentralized statistic. Coordination and technical and methodological preparation are carried out by the Federal Statistical Office with the collaboration of the statistical offices of the Länder. The latter are responsible for the survey and for processing the data for the Länder results (NUTS 1) and for providing more detailed regional results.

Survey on agricultural production methods (SAPM)
In 2010 a unique survey was carried out together with the agricultural census: the survey on agricultural productions methods (SAPM). This survey collected data at the regional level needed to establish agri-environmental indicators as indicated in COM final 508/2006 and to evaluate the greening of the Common agricultural policy.

In Germany, the SAPM was conducted as a sample survey together with the agricultural census; a stratified sampling procedure was employed and about 78 000 holdings were selected from the
The agricultural structure survey provides data on production patterns and capacities of agricultural holdings and on the economic and social situation of the farm proprietors and/or operators. The standard programme of the agricultural structure survey comprises land use and livestock population variables. This includes information on agricultural holdings with ecological cultivation.

The general part of the supplementary programme serves to compile data on labor, the determination of profits and turnover taxation and on the socio-economic situation of all holdings. The representative part of the supplementary programme deals for instance with ownership and tenancy structures, persons occupied by working hour categories and bonuses paid for environmental achievements.

The data of the agricultural structure survey are used for instance as a basis for compiling the Economic Accounts for Agriculture and for assessing measures of agricultural policy, in particular at EU level.

The agricultural structure survey is a decentralized statistic. It is coordinated and prepared in terms of technology and methodology at the Federal Statistical Office, while the statistical offices of the Länder are responsible for collecting the data and for processing them to compile Länder results.

At two-year intervals, selected agricultural holdings (sample holdings) have been covered from 1999 on a representative basis. Every forth year as of 1999, – and also for the 2003 Agricultural Structure Survey – in addition to the sample holdings all other agricultural holdings have been included in the survey and questioned about all variables of the basic programme and parts of the supplementary programme. Further selected sets of variables of the supplementary programme are covered on a representative basis at a maximum of 100,000 sample holdings.

In May of each survey year, the proprietors and/or operators of agricultural holdings with:

- An agriculturally used area of at least two hectares or a minimum of either;
- Eight cattle or pigs; or,
- Twenty sheep; or,
- Two hundred laying hens or pullets or roosters for slaughter and fryers, broilers, and other roosters or geese, ducks and turkeys; or,
- Either thirty acres of tilled vine or fruit acreage or hop or tobacco or tree nurseries or vegetable cultivation in the open or flower and ornamental plant growing or cultivation of medicinal and spice plants or seeds for commercial horticulture; or,
- Three areas of commercial glasshouse cultivation of either vegetables or flowers and ornamental plants.

If an agricultural holding meets the minimum requirements for the relevant variables, i.e. size of the agriculturally used area, livestock population or specific cultivation, the holding is included in the survey.

The respondents may either fill in the survey documents on their own or contact a survey canvasser if they wish to do so. Survey canvassers, who work on a voluntary basis, mostly have a professional
background in agriculture or administration and have been trained for the task by the statistical offices of the Länder.

The last farm structure survey was conducted in 2016. (https://www.destatis.de/EN/FactsFigures/EconomicSectors/AgricultureForestryFisheries/AgriculturalHoldings/AgriculturalHoldings.html)

Statistics on Input: Resources for farming:
- Structure of farms and agricultural surveys: area size, area for crops, live stock, labor force, machinery, fertilizer, fodder, ….
- Land use surveys
- Live stock surveys

Monetary agricultural statistics: Income and prices
- Income data by FADN-System: bookkeeping farms
- Data on prices and ZMP-Agency
- Purchases of manufacturing industries from farmers
- Sales of machinery, fertilizer, fodder for farming

Statistics on output:
- Harvest forecasts by experts
- Harvest and yield of crops production by checking weight of yield at sampled areas at farms
- Harvest surveys and reports of farmers on results
- Slaughter and meat statistics for cattle and pigs, statistics for poultry and eggs for consumption and breeding, statistics on milk,
- Statistics on wine production

Special issues:
- Data transfer and dissemination
- Registers
- Sample surveys
- LUCAS
- Flow of data from farmers to the EU
- Quality management to improve Agricultural Statistics
- Present and future aspects of statistics due to CAP: rural development, ecological issues, consumer protection, quality of products

5.3. Italy

The European Union (EU) Farm Structure Survey (FSS) collects information on the structural characteristics of the agricultural holdings (land use, livestock and labor force) and is carried out every 10 years as an agricultural census by all the EU Member States, with two or three additional, intermediate sample surveys carried out in-between. The last FSS was carried out in 2010.

Data sources for crop products statistics:
ASIA - Farm Register;
Census;
Estimations made by experts of the sector;
Sampling survey (FSS and AGRIT);
Administrative data.

Recourse to statistical methods that guarantee quality, objectivity and reliability.

In case of sampling survey:

a) Area invested in total cereals:
   • at least 95% coverage
   • standard error less than 1% or 5000ha

b) Production
   • standard error less than 2% or 50000 ton for total production
   • standard error less than 5% for any single cereal production greater than 50.000 ton

Data sources for supply balance sheet:

• Expert Estimates and sowing forecasts (ISTAT): production;
• Stocks change (MiPAAF and AGEA): stocks;
• Survey on foreign trades (ISTAT): Imp, Exp;
• Survey on Household consumption (ISTAT): human consumption in value
• Seeds (MiPAAF): Certified seeds

Data sources for vegetable statistics:

• Expert Estimates (ISTAT);
• Survey on sowing forecasts (ISTAT);
• Pilot survey on vegetables (financed by EU).

Livestock surveys:

• cover cattle, pigs, sheep, goats (poultry)
• collect data on number of animals and producers
• bi-annual for pigs and cattle (poultry)
• annual for sheep and goats

Meat production statistics:

• cover cattle, pigs, sheep, goats, and poultry
• monthly slaughtering data
• quarterly production forecasts for pigs
• semi-annual production forecasts for cattle, sheep and goats

Estimations derived from expert evaluations. Annual variations are provided with respect to year before estimates (as benchmarks) or census data when available on decade period. Estimates refer to crop period or crop year.
Provincial officers are required to deliver expert evaluations on a monthly basis in accordance with a predefined and shared calendar.

**5.4. Netherlands**

A comprehensive farm structure survey (FSS) is carried out by EU Member States every 10 years, based on the agricultural census, the last of which was conducted in 2010. Intermediate sample surveys are carried out twice between these basic surveys, with the latest farm structure survey conducted for the 2013 reference year while the next one is foreseen for the 2016 reference year. In these surveys, EU Member States collect information from individual agricultural holdings (farms), covering: the use of agricultural land; livestock numbers; rural development (for example, activities other than agriculture); management and farm labor input (including age, sex and relationship to the holder). Annual data are produced by administrative data sources.

**5.5. United Kingdom**

The structure of the farming industry including crop areas, yields and production, livestock populations, detailed labor force figures and diversification activity for England and the United Kingdom. Selected results for England are produced at a regional and county level as well as other local geographies. The June Survey of Agriculture and Horticulture is an annual survey which collects detailed information on arable and horticultural cropping activities, land usage, livestock populations and labour force figures. ([https://data.gov.uk/dataset/farming_statistics](https://data.gov.uk/dataset/farming_statistics))

In the United Kingdom, the FSS 2000 and the Agricultural census 2010 were carried out using different thresholds. Accordingly, the Scottish and the Welsh Governments, as well as the Northern Ireland assembly, have the responsibility for their own agricultural policy and data provision. The United Kingdom Department for Environment, Food and Rural Affairs (DEFRA) is the central contact point and the data supplier, though the Welsh Government, the Department of Agriculture and Rural Development of Northern Ireland and the Scottish Government are responsible for the data collection within their own borders. In 2010, a one-off survey was carried out together with the Agricultural census, the Survey on agricultural productions methods (SAPM). In the United Kingdom, the SAPM was conducted as a sample survey using a stratified sample method which took into account the United Kingdom regions, the farm size and the farm type. The sampling design targeted about 10% of farms within any given strata. ([http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_census_in_the_United_Kingdom](http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_census_in_the_United_Kingdom))

**5.6. Turkey**

Crop production statistics and the data on agricultural equipment and machinery used in agricultural production activities are compiled from province and directorates of the Ministry of Food, Agriculture and Livestock. These data are being compiled via electronically web based software since 2007.

In crop production, the data related to area, production, yield and tree numbers, both open air and land under protective cover are compiled. In crop production, there are three estimations per year. First estimation results are announced in May. Second estimation results are announced in October, and third estimation results are announced in December of the next year.
A pilot survey was conducted in 2006 to obtain crop production statistics directly from agricultural holdings and the results have been published in 2008. Also, another pilot survey was conducted to obtain data of viticulture and orchards from agricultural holdings in 2007.

While the data of area, production, yield, and tree numbers compiled within the context of crop production statistics are in conformance with the international norms, they are different in terms of data source.

In crop production statistics, CPA 2008 is used. Besides, when they are needed, key tables that enable presenting data according to other classifications can be produced.

Crop production statistics, at the national level, cover the data of crop production and agricultural equipment and machine on the web, at province and district level, starting from 1991. In order to obtain crop production statistics directly from agricultural holdings, survey implementations will start future. Furthermore, to obtain detailed information from agricultural holdings, orchard surveys will be implemented starting from 2017. (Official Statistical Program 2017-2021)

5.7. **Norway**

In Norway, the Agricultural Census in 2010 covered all the information required by the European Economic Area (EEA) agreement and was conducted by the Division for Primary Industry Statistics of Statistics Norway.

In 2010 a unique survey was carried out together with the Agricultural census: The Survey on agricultural productions methods (SAPM).

In Norway, the SAPM was conducted as a sample survey together with the Agricultural census – from the 20th of April to the 20th of June 2011. A stratified sampling method based on location, Utilised Agricultural Area and farm type was used to select the farms: 9 233 holdings were surveyed, accounting for 20% of the census population. ([http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_census_in_Norway](http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_census_in_Norway))

Annual agricultural data: All deliveries of grain and oil seeds for sale are included in the register. Grain and oil seeds for own consumption are not included.

Preliminary figures: Total yield based on forecasts from The Norwegian Agricultural Purchasing and Market Co-operation. Area of grain and oil seeds is taken from the administrative records of everyone who applies for an agricultural production subsidy in Norway.

Final figures: Yields of grain and oil seeds based on the administrative records of the Norwegian Agricultural Authority on all deliveries for sale. Area of grain and oil seeds is taken from the yearly updated population of agricultural holdings established in Statistics Norway. ([https://www.ssb.no/en/jord-skog-jakt-og-fiskeri/statistikker/korn](https://www.ssb.no/en/jord-skog-jakt-og-fiskeri/statistikker/korn))
5.8. Brazil

The agricultural census collects information on agricultural establishments, forests and/or aquaculture of all municipalities of a country. The goal of this research is to update previous census data and to provide information about economic, social, and environmental farming. It usually occurs every 10 years.

The Brazilian Institute of Geography and Statistics (IBGE) carried out the Census of Agriculture 2006, shared information on the economic activities performed by farmers and agricultural enterprises, in national level.

The information presented consolidates structural data about the agricultural sector, comprising statistics on the number of establishments, land use, number of tractors, implements, machinery and vehicles, characteristics of the establishment and of the producer, employed persons, livestock heads, vegetable and animal productions, among other aspects. Those statistics are vital to the understanding of transformations in agricultural activities and those of the rural environment, in the different geographical spaces of the country, since the last survey conducted in 1996.

The results of the Census of Agriculture 2006 are in accordance with recommendations and basic principles embraced by Food and Agriculture Organization (FAO) of the United Nations Organization (UNO), which allows the international comparability of those statistics.

The next agricultural census is planned for 2017, after the 2016 census was cancelled due to insufficient funds.

The Systematic Survey of Agricultural Production

Provides monthly information about the forecast and monitoring of agricultural harvests, with estimates for production, average yield and planted and harvested areas, having the municipal districts as collection units. The survey was started in 1972. The survey frequency is monthly. Geographic coverage consists of Brazil, Major Regions and Federative Units.

Survey of Stocks

This survey provides conjuncture data on the volume and spatial distribution of stocks of the main farm products and on the units where they are stored, having as collection units the establishments dedicated to storage and dry storage services or those which store farm products or their derivatives. The survey was started in 1958 and interrupted in the period 1966 to 1971. Survey frequency is every semester. Geographical coverage includes Brazil, Major Regions, Federative Units, Meso-regions, Micro-regions and Municipal Districts.

Municipal Livestock Production

IBGE puts out the results of the Municipal Livestock Survey, with information on herd inventories, quantity and value of animal products, as well as the quantity and value of animal products, including aquaculture. number of milked cows and sheared sheep by Major Regions, Federation Units and major producing municipalities. It is worth mentioning that, from this edition on, the survey will investigate, besides the inventories of hogs and pigs, the inventories of the matrices of
these species; on the other hand, asses, rabbits and mules will no longer be investigated due to the reduced economic importance of such herds for livestock farming as a whole. (https://ww2.ibge.gov.br/english/estatistica/economia/)

5.9. Colombia
Agricultural censuses
Agricultural censuses are a result of joint efforts between certain unions and the Ministry of Agriculture and Rural Development. These censuses were initially carried out to provide information on the area, production and yield regarding certain crops. However, they are also used as statistical frameworks for conducting specific surveys, as well as to improve and update stratification of the area’s agricultural frame.

Departamento Administrativo Nacional de Estadística (DANE)’s interest in detailed figures on the Colombian flower industry determined the research design of the Census of Flower Production Units. This research provides data on topics such as planted area, production by type of flower, plant conditions, pest management, waste management, staff employed and participation of the flower industry in the country’s gross domestic product. Given that the major concentration of the production area is in the departments of Cundinamarca and Antioquia, 28 municipalities of the department of Cundinamarca were defined as the initial geographic area for data collection that gave the first result presented herein.

The Agricultural Survey carried out in the region of moors in Guerrero, Iguaque, Merchán, Rabanal and the spring of the river Bogotá, seeks to gather information on the agricultural activity in rural areas at altitudes above 3000m above mean sea level, and the importance of conserving goods and services that supply the ecosystems of the moors. Under an expanded form design developed with the Research Institute Alexander von Humboldt, this survey investigates the type of vegetation, the presence and consumption of water, and identification of conservation practices that take place in these areas.

Animal Slaughter Survey
The Animal Slaughter Survey compiles statistics on a number and weight of live and slaughtered cattle. The information for slaughtering of big (cattle and buffalo) and small breeds (pigs, sheep and goats) for the national total and different levels of disaggregation is timely and reliable, which facilitates the analysis and planning in the livestock subsector.

Price Information System - SIPSA
SIPSA is in charge of informing the users on the wholesale prices of agro-food products sold in the country. SIPSA provides the information input and factors associated with agricultural production and the level of food supply.

The National Survey of Mechanized Rice Production
This Survey seeks to estimate the size of planted area, production and yield of mechanized rice farming (irrigated and dryland). There is detailed information available regarding planted area for mechanized rice production. The information is collected monthly from the production systems.
The National Agricultural Survey
This Survey seeks to estimate the use of land, size and distribution of sampling segments. It also provides data on the area, production and yield of major temporary and permanent crops; pasture area, milk production, and livestock inventory. (http://www.dane.gov.co/index.php/en/statistics-by-topic-1/agricultural-sector/)

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<th>No.</th>
<th>MODULE, INFORMATION UNIT AND INSTRUMENT OF RESEARCH</th>
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<tr>
<td>2.2</td>
<td>Livestock: Milk industry, poultry tech, tech hog, shrimp farming, inland fisheries and sea (Maritime industry) and administrative records of the fund paraifcal livestock.</td>
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<tr>
<td>2.3</td>
<td>Other (technological innovation, quality certification, environmental management and sustainable social and opinion, etc.)</td>
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<td>3.2</td>
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5.10. Argentina

National Agricultural Census
The National Agricultural Census allows the collection of data on the main characteristics of the organizational structure and production of the agricultural sector.

Their results describe the basic characteristics of the agricultural, livestock and forestry activities of all the agricultural operations (EAP) of the country, the economic and financial variables of the agricultural enterprise, and also allow to identify and quantify the new forms of organization of agricultural production. The last National Agricultural Census (CNA’08) was implemented in 2008.

Agricultural Surveys
The agricultural surveys allow to measure the evolution of the main variables of the production of cereals, oilseeds, forage crops and regional crops, as well as to know the stocks and composition of the main livestock species.

Agricultural production
Agricultural, forestry and fisheries production statistics are prepared by the Ministry of Agriculture, Livestock and Fisheries; the Argentine Chamber of Poultry Producers and the Secretariat of Environment and Sustainable Development. (https://www.indec.gov.ar/)

5.11. Australia

The Agricultural Census is one of the largest statistical collections undertaken by the Australian Bureau of Statistics (ABS) and provides data on agricultural holdings operated by Australian farming businesses. Up until 1996-97, the Agricultural Census was conducted annually, at the end of March. The current strategy is for five-yearly census with sample surveys in inter-censal years. Data was collected throughout 2015-16 from businesses ranging from beef cattle production to broad acre farming and vineyards. Statistics on land use, crop and horticultural area and production, livestock numbers, farm management and demographic information are collected in the 2015-16 Agricultural Census.

The scope of the 2015-16 Agricultural Census was all businesses undertaking agricultural activity recorded on the Australian Bureau of Statistics’ Business Register (ABSBR) above a minimum threshold applied to the estimated value of their agricultural operations.

Data collected from around 104,000 businesses ranging from beef cattle production to broad acre farming and vineyards has produced a picture of Australia’s agricultural sector.

The Australian Bureau of Statistics (ABS) also collects counts of businesses operating in agriculture and areas of agricultural land through the Agricultural Census, conducted once every five years, and the Rural Environment and Agricultural Commodity Survey (REACS) conducted annually in the intervening years.

The Agricultural Survey is the basic source of Australian agricultural commodity statistics.
The Agricultural Survey (AS) is conducted annually. Approximately every fifth year, an Agricultural Census will be conducted in place of the AS. The frame population of the AS is all establishments with an Estimated Value of Agricultural Operations (EVAO) of $5,000 or more. The sample size for 2001/02 was approximately 35,000 respondents, and for 2002/03, it was 28,000. The sample for the 2003/04 Agricultural Survey is a combination of: (a) a reduced sample from the same selections as the 2001/02 Agricultural Survey (about 28,000 of the original 35,000 units); and (b) 3,000 new selections from the 2002 frame (to account for sample loss due to the increasing number of deaths). This extra sample will target industries where survey results for commodities are creeping out towards or beyond design parameters. The Agricultural Survey collects area and production data for a wide range of agricultural commodities. This commodity data is used to produce data on the Value of Agricultural Commodities Produced (VACP). Information on inputs to the production process is also collected and disseminated.


5.12. Japan

The Census of Agriculture and Forestry in Japan was first conducted in 1950 in keeping with World Programme for Census of Agriculture 1950, advocated by the Food and Agriculture Organization (FAO). The Forestry Census has been conducted since 1960. Thereafter, Japan has conducted the World Census of Agriculture and Forestry every ten years based on International Convention focused on Economic Statistics. Japan has also conducted the Agricultural Census in the interim years between each World Census keeping in mind its original national perspective. From the 2005 Census of Agriculture and Forestry, the Forestry Census has been conducted every five years to ensure a unified and timely grasp of agricultural and forestry management. The 2015 Census of Agriculture and Forestry is the fourteenth report for agriculture and the eighth report for forestry. For the 2015 Census of Agriculture and Forestry, the following survey items have been reviewed before conducting the survey in order to smoothly and efficiently conduct the survey by corresponding to the changes in the situation surrounding agriculture, forestry and rural areas in our country and the trend of agriculture/forestry policy. The Survey on Agriculture and Forestry Management Entities: Planted Area for Industrial Crop, Vegetables and Fruit and Nuts was surveyed for the purpose of strengthening a function as the information infrastructure that Census of Agriculture and Forestry should accomplish. (Monthly Statistics of Agriculture, Forestry and Fisheries, August, 2017)

5.13. South Africa

On 5 August 2013, Statistics South Africa published an ‘Agricultural Households’ report which is based on Population Census 2011 (Census 2011). This report covers all types of agriculture, namely subsistence, smallholder and commercial. This is an important milestone since as a country, we are taking the first step to better understand and inform the public on the subsistence and smallholder agriculture.

The report follows in the decision to include the following three questions related to agriculture in the Census 2011 questionnaire, namely:

- What kind of agricultural activity is the household involved in?
• How many of the following (livestock) does the household own?
• Where does this household operate its agricultural activities?

The information from the Census 2011 will also complement Statistics South Africa’s current tax-based register to develop a complete list of all agricultural activities in the country in line with the recommendations of the United Nations’ Food and Agriculture and Organisation (FAO). This list will be used to conduct further in-depth surveys related to agriculture.

The Community Survey 2016: Agricultural Households Report is the second in a series of reports on South African households engaged in agricultural activities. The first was published in 2013 and presented results based on the Census 2011 data. This report presents data collected during the Community Survey 2016.

The agricultural survey is an annual survey which measures economic activity in the farming sector of the South African economy. This survey covers enterprises registered in the taxation system that are mainly engaged in agriculture and related services. It includes the following major groups within its scope: (i) Growing of crops, market gardening and horticulture. Farming of animals. Growing of crops combined with farming of animals (mixed farming). Agricultural and animal husbandry services, except veterinary activities. Hunting, trapping, and game propagation including related services. and Production of organic fertiliser. (Agricultural Survey 2016, Statistical Release P1101)

5.14. Morocco
Area and yield data of the three main cereal crops (soft wheat, durum wheat and barley), were provided by “La Direction de la Stratégie et des Statistiques” (DSS).

Area and yield data of the three main cereal crops were provided for 40 provinces of the country. Production at the province level is obtained by multiplying the yield value with the area estimated by DSS. Area estimations for cereal crops in Morocco is made every year by DSS between February 10th and March 30th, using a sampling method of 3,000 unit areas representing 19 million hectares. Starting since 2008, DSS has renewed the sampling procedure to integrate modern techniques of satellite remote sensing and GIS which improved precision of estimators. (E-AGRI D21.4: Report describing regional statistics for Morocco. 2014)

6. Conclusions

The sources of information in agricultural statistics are censuses, sample surveys, reports submitted by regional offices, cooperatives, and agricultural enterprises, data obtained from bookkeeping and production accounting at such farms.

Data collection, analyzing and publishing of agriculture sector differs country by country. Data availability, sufficient funds and time affect the agricultural statistics system. According to result of the country experiences an agricultural statistics system must include the sources of information census, sample surveys, registers and administrative data sources.
An important point is that each country must develop a Master Sampling Frame for Agriculture to improve their data collection system and quality of statistics.

The country experiences consider countries that range from among the largest in the world to several small countries. All of these differ in terms of their agricultural and economic structures. A common element in their efforts to develop sampling frames for agriculture is that most countries make use of both area and list frames in a multiple frame context.
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