

## A 2020 Round of Agricultural Surveys<sup>1</sup>

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### Abstract

The World Census of Agriculture (WCA) rounds constitute the main recommendation that has guided the production of agricultural statistics for almost one hundred years. The census stands as the major accomplishment in the statistical programme regarding agriculture, even though its objectives have been radically changed over time. In the course of its existence FAO has published several textbooks about continuing surveys, many of them dedicated to methodology and, to a lesser extent, to standardization of concepts and priorities. There are still too few of these documents, which have no clear connection and no systematic update. As a result, they lack a general direction similar to that in censuses. The global strategy largely aims to meet these needs, highlighting the need to structure integrated survey systems. This study (a) examines the evolution of the goals of the WCA programme; (b) argues that although it is essential to reveal aspects of rare events and small domains, and the best alternative for frame structuring, the agricultural census itself does not meet the main statistical requirements in a world eager for the latest information; and (c) indicates a need to further these trends in recommendations for integrating national agricultural survey systems in compliance with all current information requirements.

Keywords: agricultural census, sample surveys, surveys system, world census

### 1. Why perform Agricultural Census? From global to local figures

The First World Agricultural Census was conceived and run under the International Institute of Agriculture, and its objectives obviously reflected the Institute's key concerns. The Institute's goals were to help farmers share knowledge, produce systematically, establish a cooperative system of rural credit, and have control over the marketing of their products. This, then, means census recommendations that "one of the principal objects of the census is to ascertain as accurately as possible the quantities of each one of the products obtained from the crops, the woods and forests or the livestock in the census year" (The First..., 1939, p. 47, our emphasis). Most of the basic questionnaire was in fact dedicated to information on agricultural production and a number of issues on structural aspects, then addressed as secondary.

The 1950 Round Programme justifies the Census because of the "need to obtain internationally comparable statistics" (Programa..., 1948. preamble, p. iii), and its purposes indicated as "obtaining from each government precise and internationally comparable information".(p.1)

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Post-war thinking is considered to have influenced the 1960 programme objectives. The census, on the contrary, is addressed as a means to provide basic statistics to prepare agricultural development plans and other food and agricultural policies. “The programme envisaged that each government participating in the world agricultural census would, as far as possible, obtain accurate and internationally comparable information on the structure of its agriculture.”(Report...,1969, p.4). The 1970 programme defines agricultural census as “a government-sponsored operation for the collection of quantitative information on agricultural structure ...”. (Programme..., 1965, p1), “production of crops, livestock and poultry is included in the “Expanded List”... although production data are often better collected by methods other than a census (p.7) The report on the 1980 World Agricultural Census reaffirms the objective of collecting “basic quantitative information on farming structure...” (FAO, 1992). The programmes, however, continue including proposals relating to volume of production of principal crops and some livestock products.

The 1990 programme explains two basic objectives: (a) to collect data on agricultural structures which do not change rapidly from year to year; (b) to provide a frame for other agricultural surveys on holdings. (Programme..., 1986, p. 7, our emphasis)

The structural nature of the Census is resumed in the 1990 programme: “1.12 An agricultural census is best suited to collecting data on various characteristics relating to agricultural holdings that change only slowly over time because it is usually conducted at ten year intervals ... 1.13 Structure is in contrast to performance, which relates to the prices and quantities of inputs and outputs, enterprise costs and returns and net farm income. Data on the performance of agricultural production sector as well as on other important policy indicators such as food prices, consumption and nutrition that change rapidly over time can best be collected through frequent sample surveys.” (Programme..., 1986, p. 4)

In the 2000 WCA Programme three basic objectives are listed: (a) To provide aggregate totals for fundamental agricultural data to use as benchmarks for inter-censal estimates. (b) To provide a frame for other agricultural sample surveys.(c) To provide data for small administrative units and detailed cross-classifications of farm structural attributes (Programme..., 1995, p.18)

The latest census programme – WCA 2010 -, in turn, defines four basic objectives: (a) To provide data on the structure of agriculture, especially for small administrative units, and to enable detailed cross-tabulations; (b) To provide data to use as benchmarks for current agricultural statistics; (c) To provide frames for agricultural sample surveys; (d) To provide data to help monitor progress towards global development targets, in particular the MDGs. (A system..., 2005, p.17)

## **2. About the evolution of Agricultural Census objectives**

Considering that the agricultural census is an operation of longstanding tradition, it is natural that over the decades, its objectives and scopes have undergone changes. In line with the farming activity’s own historic development, and even as a result new resources, techniques, uses, requirements and opportunities. Drawing up a balance of objectives requires, before detachment, an effort of approximation and positioning regarding time and the environment under penalty of committing if not anachronistic then extempore assessments.

It is, however, possible to talk about a mystique of censuses associated with its basic characteristics. A mystique still is strong, on one hand, due to the census method being simple and easy to understand; and on the other, by the very fascination from the implicit enormousness deriving from the predisposition of complete enumeration of the investigated units. The easy understanding derives precisely from the simplicity of its traditional method. A method that can be said goes back to statistical arithmetic, where the statistical aggregates are obtained basically by adding them up.

In the 1920s, when the first world census was created, the census technique was the sole method of obtaining accurate statistics. It may be said that the census objectives were focused on obtaining global reliable production data. It was therefore found that the census operation was not able to provide information in a truly useful or pertinent timescale. The census results only became available with a time lag of years. Considering, in short, that it would be most feasible in the ten-year period, its “natural vocation” is therefore identified as provider of structural information. And more, the census is no longer indicated as the better resource for obtaining accurate data.

The importance of the structural information in itself cannot be underestimated. However, the vocation for collecting information “which do not change rapidly from year to year”, seems to be more like a limitation than a virtue. Strictly speaking, the structural aspects can equally be obtained from sample surveys.

Since the 1990 round, the provision of a sample frame appears as a secondary census objective. There is no doubt that it is from the census that the most efficient sample framework can be derived. However, alternatives were being developed using administrative records or images, dot/area sampling or the combination of frames. Thus, this secondary function is not per se a reason for justifying the priority given to the census.

It would be anachronistic to expect that the supply of detailed information is one of the key objectives of census, at a time when results were solely provided by hardcopy documents. It is reasonable that the table plan only foresaw the publication of the main data, for the levels of geographic detail of administrative interest and a limited number of cross-tabulations. This purpose arises in WCA 2000<sup>3</sup> and appears rightly in a well-deserved position in the first objective correlated with the production of structural information in the WCA 2010.

### **3. Data and agricultural holding survey needs in the 21st century**

Those highlighted in Global Strategy to Improve Agricultural and Rural Statistics (GS) could be adopted as a benchmark for contemporary needs of agricultural statistics

The purpose of GS is to provide a benchmark for national and international statistics agencies concerning the production of data and basic information on agricultural and rural questions required for the 21<sup>st</sup> century. It recognizes the key role of agricultural development in achieving the Millennium Development Goals. Emphasis is given on data that permit comprehensive and integrated analyses of the economic, environmental and social status; and which respond to the emerging topics, highlighting rural poverty, food security, supply and price fluctuation, biofuel production, and the impacts of the economic activities on life on our planet.

The GS lists a minimum set of key indicators to be supplied by the countries on a regular basis to meet the current and emerging requirements, including methodology to determine content, scope and frequency for the minimum set of core data and additional items to meet national data priorities. The set of core indicators includes quite a broad range of key variables; variables on economics (output, trade, inventory, inputs, agro-processing, prices, final expenditure, rural infrastructure, international transfer); social aspects (demographic data); environment (land, water, air); and

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<sup>3</sup> “*Metodos de Muestreo para las Ecuestas Agrícolas*” by Leslie Kish, was the first document which briefly mentions that: “...the prime objective of a census consists typically of obtaining a complete detailed image of the number (size) and basic structural and like characteristics of the population and provide as many details as possible in relation to the small domains and especially local zones...”(Kish & Verna (1986) apud FAO, 1990, p. 305, free translation).

geographic location. The document, however, clarifies its core motivations, with emphasis on the questions on price volatility and food availability, and the repercussion on topics such as poverty, agro-energy and environmental impact.

In fact, curiously enough, it emphatically reiterates the same needs that were the basis for the First World Agricultural Census. It also calls attention to the need for accurate data that can be compared internationally with annual (!) or even monthly temporality. It follows as a corollary that the agricultural census would not be the key operation of the agricultural survey system.

On the other hand, it should be mentioned that GS attributes to the ten-year census obtaining data within a detailed administrative area and those relating to minor products (World Bank, 2010, p. 14-18). In this way, the GS perceives a role for the census beyond structural information.

Thus, it is clear that the key role of the census is to supply detailed data but also data on rare events, so that in both cases not only in relation to structural information but also with regard to production data, not achievable in sample surveys although available only every ten years<sup>4</sup>.

#### 4. A round of agricultural surveys

The coordination among census and sample surveys is reflected in the World Census Programme's own performance in recent decades. The WCA 1970 mentions that the census "offers an excellent base and framework for planning surveys to secure agricultural statistics". (Programme..., 1965, p.1). The WCA 1980 "stresses first priority should be given to the development of a coordinated and integrated system of agricultural statistics by using the agricultural census as a basis for collection of current data..." (Programme..., 1976, p2). Such maximum priority, however, was not translated in specified recommendations. The 1990 programme points out that, since 1966, attention was given to establishing an integrated set of data sources in which the census would be one of the components (FAO 1968 apud Programme..., 1986). The document "Food and agriculture statistics in the context of a national information system" indicates that "...it is recommended that all statistical development efforts should be oriented toward the long-term goal of establishing an integrated statistics programme that will provide a continuous stream of timely, accurate data covering all relevant aspects of food, agricultural and rural development." (FAO 1985 apud Programme..., 1986, p. 3). The WCA 2000 contains a chapter acknowledging the census as a necessary part of an integrated statistical system, but not advancing far in relation to the integration mode.

The WCA 2010, with the introduction of the core module scheme and supplementary modules of the census and its connection with the agricultural surveys, is presented as a framework of the system of integrated agricultural censuses and surveys. It specifies that "This system can be viewed as having two elements: (i) the agricultural census, which is the nucleus of the system; and (ii) the programme of agricultural sample surveys, based on the agricultural census."

However, WCA 2012 Vol.1, dedicated to the World Census, focuses mainly on the agricultural census element of the system, devoting a single chapter to briefly discuss the programme of agricultural surveys, promising that further information on these surveys would be provided in later volumes. These volumes, however, never happened.

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<sup>4</sup> The GS does not specify a preferable source or recommendable frequency for the large majority of key variables. It only ponders that time and available resources result in a necessary compromise between frequency, level of geographic detail, and other breakdown indicates that this is considered when establishing an integrated survey framework.

In fact, regardless of coordination requirements, limited attention was given to the systematic production of recommendations relating to continuing surveys for agricultural holdings<sup>5</sup>. With regard to major FAO contributions through some reference works on sampling methods<sup>6</sup>, there is not one single full recommendation to the similarity of those produced with view to agricultural censuses. Even less when addressing the efforts and types of campaign that could be undertaken to prepare, disseminate, support and encourage sample surveys, unlike that devoted to planning and conducting agricultural censuses.

In any case, what appears to be necessary is a text of recommendations and joint approach. In this sense, the proposal for the period 2016-2025 is an edition of “a 2020 Round of Agricultural Surveys” consisting of a fully integrated world programme for agricultural holding sample surveys and censuses.

In the concept discussed herein the agriculture census would be one of the system’s component surveys. The component directed to collecting data, for which greater geographic details and information are required on fewer events that appear alongside the components that require more frequency and on more common and more important events.

In addition to the necessary and desirable integration and synergy of the continuing census operations in their many operational and technical aspects and of statistical methodology, including mechanisms to guarantee coherence in estimations, the benefits of this approach become more relevant when determining an efficient coordination and optimization in distributing contents among survey items and periodicity of the surveys, in a really multi-year programme (!). This implies a thorough revision of objectives and organization of topics, perhaps representing the biggest methodological challenge ever faced.

From the perspective suggested herein, it would, for example, be appropriate to let the census and continuing surveys be differentiated, one as special and necessarily bearer of structural topics, and the other on performance-related topics. It would mean establishing, for example, which structural aspects do not require further geographic details and may appear in sample surveys, albeit through supplements with longer periodicity than annual, releasing the census from addressing them and, on the other hand, establish those fewer items, although relating to specific products and their performance, the survey of which can only be assured with the comprehensive coverage of the census operations.

In this sense, the agricultural sample surveys would not be exactly inter-censal surveys, since their purposes should be achieved every year. In the census years, either supplements corresponding to additional requirements of the census form would be supplementary in the annual surveys, or the components of the current surveys would appear as supplements in the census questionnaires directed to the agricultural holdings included in the farming units, present in the samples of continuing surveys. In short, an approach that considers and reports on integrated planning of the set of surveys and statistical studies from agricultural holdings.

## 5. Conclusion

Surveys that have the agricultural holding as an investigation unit, including therein the censuses, are key sources for meeting data needs. Today it is imperative to

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<sup>5</sup> In 1996, FAO published a document especially on the topic: Conducting agricultural censuses and surveys (FAO, 1996). In spite of the title, however, the volume is in fact devoted to the methodology for conducting censuses. It earns this name because it also addresses the alternative to conducting the Census without comprehensive lists using sampling techniques.

<sup>6</sup> Mention of “*Metodos de Muestreo para las Ecueltas Agrícolas*” (1990) and “Multiple frame agricultural surveys”. V1 (1996) and V2 (1998).

coordinate them to configure a single and integrated survey system. A coordination that considers, in relation to the Census, the information actually required at detailed levels and that can be collected accurately in operations of this size, and, in relation to the sample surveys, those required most often or that need more powerful procedures of accuracy, only enabled by smaller operations.

So, for the present, the most needed recommendation aiming at the improvement of the agricultural statistics system is a "2020 Round of Agricultural Surveys", consisting of a multi-year and fully integrated world programme for agricultural holding sample surveys and censuses.

## 6. Bibliography<sup>7</sup>

A system of integrated agricultural censuses and surveys – Vol.1. World Programme for the Census of Agriculture 2010, FAO Statistical Development Series 11. Rome, 2005

FAO. Statistics and studies for agricultural development planning: a phased programme. Rome: FAO, 1968

FAO. Food and agricultural statistics in the context of national information system. Rome: FAO, 1985

FAO. *Metodos de Muestreo para las Ecuestas Agrícolas*. Roma: FAO, 1990. (FAO Coleccion FAO: desarrollo estadistico 3).

FAO. Informe sobre El censo Agropecuario Mundial de 1980. Rome: FAO. 1992 (FAO Collection: Statistics, No 107)

FAO. *Realización de Censos y Encuestas Agropecuarias*. Rome: FAO, 1996. (FAO Coleccion FAO: desarrollo estadistico 3).

MULTIPLE frame agricultural surveys. Rome: FAO, 1996. v.1. Current surveys based on area and list sampling methods.

MULTIPLE frame agricultural surveys. Rome: FAO, 1998. v.2. Agricultural survey programmes based on area frame or dual frame (area and list) sample designs.

Programa del Censo Agropecuario Mundial de 1950. Washington, 1948

Programme for the 1960 World Census of Agriculture. FAO, Rome, 1957

Programme for the 1970 World Census of Agriculture. FAO, Rome, 1965

Programme for the 1980 World Census of Agriculture. FAO, Rome, 1976

Programme for the 1990 World Census of Agriculture, FAO Statistical Development Series 2. Rome, 1986.

Programme for the World Census of Agriculture 2000, FAO Statistical Development Series 5. Rome, 1995

Report on the 1960 World Census of Agriculture. Volume III. Methodology. Rome, 1969.

Report on 1990 World Census of Agriculture: Methodological Review, FAO Statistics Division, [Rome], [2008] (unpublished internal draft).

The First World Agricultural Census (1930), Vol. I: Standard form, Methodological Study, Notes on tabulation of the census results, International Institute of Agriculture (IIA). Rome, 1939

WORLD BANK. Global Strategy to Improve Agricultural and Rural Statistics. Report Number 56719-GLB. Washington, DC: World Bank, September 2010. 55p.

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<sup>7</sup> Although considered important for conducting this study, no access was available to the document "Programme of the World Agricultural Census of 1940, International Institute of Agriculture (IIA). Rome, 1938"