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Progress and vision on
World Programme for the Census of Agriculture (WCA)

**Methodological Review of the WCA 2010
in Latin America and the Caribbean
and issues for WCA 2020¹**

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Abstract

This paper presents the progress made towards implementation of the FAO 2010 World Programme for the Census of Agriculture (WCA 2010) covering the period 2006-2015. Besides reporting on the current status around the world, the paper provides methodological review of practices of Latin America and the Caribbean countries. The paper specifically focuses on the application of the new futures of WCA 2010 by countries in the region, lesson learnt and possible issues to be addressed in the WCA 2020.

I. INTRODUCTION

1.1 Background

FAO prepared and issued in 2005 a programme for the 2010 round of agricultural censuses, covering the period 2006-2015. It is the ninth decennial programme of agricultural censuses of the series which started in 1930. After its formation in 1946, FAO assumed responsibility for agricultural censuses, and has so far promoted and completed six rounds beginning with the programme for the 1950 round. FAO's role in the programme has been: preparing and disseminating standards and guidelines for taking agricultural censuses; providing direct technical assistance to countries through projects; and summarizing data and metadata from national censuses for international comparisons. The lessons learnt from each round are ploughed back in the development of the design of the next round.

The 1930 and 1940 agricultural censuses aimed to provide comprehensive data on agricultural structure and production activities, but were difficult for many countries to implement. From 1950, the content of agricultural censuses was thus limited to data on the structure of agricultural holdings, such as land use, farm size, area of crops grown, structure of livestock herds, farm machinery, and agricultural inputs. Over the years, the content of the agricultural census has widened to include new areas of interest; the 2000 round included data on gender and the environment [FAO, 1995].

The 2010 programme provides guidance on 12 themes and 87 data items including many completely new or significantly modified data items [FAO, 2005]. An indicative classification of crops based upon Common Product Classification was suggested to be used for greater international comparability of data collected through agricultural census. A modular approach to collection of data through integrated planning of surveys was proposed. Greater coordination between population and agricultural censuses was advocated to gain cost-efficiencies and to increase the scope of data collection. A community survey on agricultural infrastructure was advocated to be carried out with the agricultural census to make data available for decentralized planning and targeted area development.

1.2 Importance of the census of agriculture

A census of agriculture is a statistical operation for collecting, processing and disseminating data on the structure of agriculture, covering the whole or a significant part of the country. Typical structural data collected in a census of agriculture are size of holding, land tenure, land use, crop area harvested, irrigation, livestock numbers, labour and other agricultural inputs. Typically in an agricultural census, data are collected directly from agricultural holdings, but some community-level data can also be collected at the time of listing operation. The agricultural census data is useful for a variety of economic and social fields including monitoring progress towards the Millennium Development Goals, and in analyzing poverty, food security and gender issues. Other uses of agricultural census data include planning and policy making and improving current agricultural statistics.

The main objectives of the census of agriculture are: (a) To provide data on the structure of agriculture to the level of 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. The WCA 2010 advocated a census not as an isolated exercise but as centre piece in the system of agricultural surveys. [FAO, 2005].

II. OVERVIEW OF THE IMPLEMENTATION OF WCA 2010

2.1 Advocacy and Training

In order to promote the implementation of the new recommendations of the 2010 WCA Programme by countries, FAO organized a series of round table technical meetings in all regions to present and discuss the recommendations with the national leaders of the agricultural censuses. The roundtable meetings were organized in Bangkok, Thailand (2005), Chile, Santiago de Chile (2008), Egypt, Cairo (2008), Budapest, Hungary (2009). In addition, specific capacity building workshops on special subjects like Sampling for Agricultural Censuses and Surveys (Accra, Ghana 2010; Bamako, Mali 2011; Montevideo, Uruguay 2011; Amman, Jordan 2011; Bangkok, Thailand 2012) and Linking Population and Housing Censuses with Agricultural Censuses (Nouméa, New Caledonia 2012; and Amman, Jordan 2012) were also organized for the benefit of member states. These series of capacity building workshops are still ongoing. The next workshop on Linking Population and Housing Censuses with Agricultural Censuses will take place in Port of Spain, Trinidad and Tobago between 10 to 12 June 2013. FAO continues to provide direct technical assistance to a large number of countries in conducting their censuses through field projects.

2.2 Overview of progress of the WCA 2010 round in the world

A review of the implementation of agricultural censuses for this round (2006-15), based on information available to FAO, shows that so far, out of a total of **191** FAO member countries² **102** countries have already conducted an agricultural census and about **42** are planning to carry out one during the next three years. This is expected to result in an unprecedented rate of participation of countries in a WCA round. The last record related to 122 participating countries in WCA 2000 round. The number of countries that conducted an agricultural census

² As of 25 June 2011, FAO has 191 member nations, this number exclude the European Union and the two 2 Associate Members (Faroe Islands and Tokelau)

during a rounds since 1960 ranges between 90 and 122. Globally, the pace of implementation of the 2010 round by countries is in line with past trends. The figure of **102** countries that already have carried out a census during the first 7 years of the 2010 round, represents a promising end of the round result. Europe is the leader with **90%** of countries already having conducted a census, followed by South America with **69%** of countries, North and Central America with **55%** of countries, Oceania with **53%**, Asia with **44%** of countries and Africa with **22%** of countries.

Table 1 below presents a comparative picture of the implementation of agricultural censuses during various rounds in all regions. The grouping of countries by regions follows the standards recommended by the United Nations Statistics Division (UNSD) on the composition of macro-geographical (continental) regions viz. Africa, Americas, Asia, Europe, and Oceania. However, to be able to draw meaningful conclusions from the analysis of country practices, the countries in the Americas have been classified into two groups: “America, North and Central” and “America, South” which is consistent with division into sub-regions proposed by the UNSD. This grouping is in conformity with the one used in the earlier publications of the FAO Statistical Development Series.

Table 1. Trend in participation of countries and territories in the WCA rounds
(number of countries)

| Region | Round | | | | | 2010 (Census conducted until 2013) |
|---|-------|------|------|------|------|---|
| | 1960 | 1970 | 1980 | 1990 | 2000 | |
| Number of FAO members at the end of each round | 109 | 132 | 154 | 173 | 189 | 194 ³ |
| Number of participating countries to the census | 100 | 111 | 103 | 90 | 122 | 102 |
| Africa (54) | 28 | 25 | 23 | 20 | 25 | 14 |
| North and Central America (27) | 19 | 23 | 18 | 16 | 14 | 15 |
| South America (13) | 11 | 10 | 7 | 7 | 8 | 9 |
| Asia (48) | 19 | 19 | 21 | 14 | 29 | 19 |
| Europe (39) | 17 | 24 | 22 | 20 | 29 | 35 |
| Oceania (19) | 6 | 10 | 12 | 13 | 9 | 10 |

*The number in the brackets in the first column is the current number of the FAO member countries and territories in each region.

³ [As of 25 June 2011, FAO has 192 Members (191 Member Nations and 1 Member Organization, the European Union) and 2 Associate Members (Faroe Islands and Tokelau)]

2.3 Overview of the WCA 2010 round in Latin America and the Caribbean region

Latin America and the Caribbean region here refers to the 36 countries and territories out of which the 33 countries are covered by FAO Regional Office for Latin America and the Caribbean (FAORLC) and the 3 French overseas departments

(French Guyana, Martinique and Guadeloupe) are covered by FAO Regional Office for Europe and Central Asia (FAOREU). Table 2

below, prepared on the basis of information available to FAO, presents Latin America and the Caribbean countries which have

already conducted an agricultural census and those which are

planning one in the current decadal round (2006-2015). Out of

36 countries and territories, 20 have conducted an agricultural census, seven are planning to

carry out one before the end of the round. This brings the expected participation rate of about 75% for WCA 2010. On nine countries no information was available to FAO at the time of writing the paper and one country, Belize has collected some data on structure of agriculture in its population census.

Chart 1. Latin America and the Caribbean

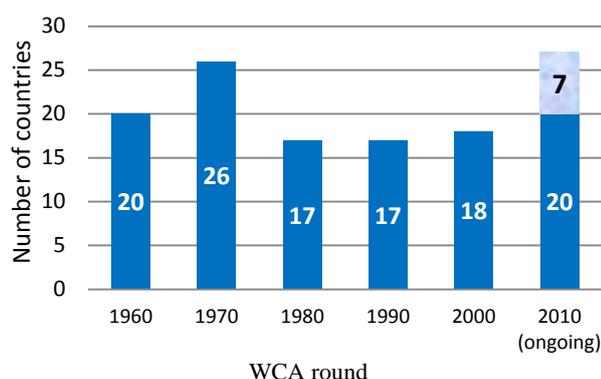
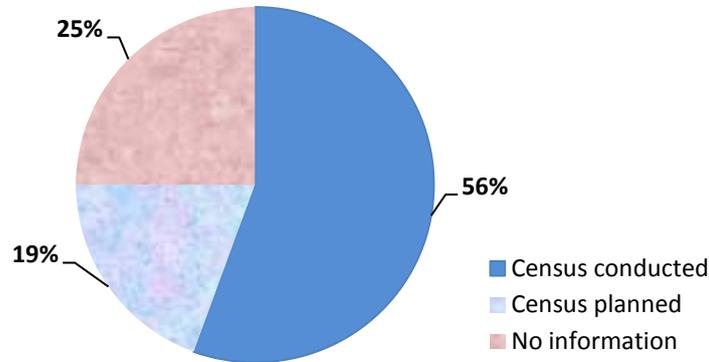


Table 2. Agricultural Censuses in Latin America and the Caribbean region in the 2010 WCA round (2006-2015)

| Latin America and the Caribbean (36)⁴ | | | |
|---|-----------|--|-----------|
| Census conducted | 2006-2012 | Antigua and Barbuda (2007), Argentina (2008), Brasil (2006), Chile (2007), El Salvador (2007/08), French Guyana (2010), Granada (2012), Guadalupe (2010), Haití (2008/09), Jamaica (2007), Martiniqués (2010), México (2007), Nicaragua (2011), Panamá (2011), Paraguay (2008), Perú (2012), Surinam (2008), Saint Lucia (2007), Uruguay (2011), Venezuela (2007), | 20 |
| Census planned | 2012-2013 | Bolivia (2013), Colombia (2013), Dominican Republic (2012/2013), Guatemala (2013), Honduras (2013). | 7 |
| | 2014-2015 | Costa Rica (2014), Ecuador (2013-2015) | |
| Information not available | | Bahamas, Barbados, Cuba, Dominica, Guyana, Saint Kits and Nevis, Saint Vincent and the Grenadines, Trinidad and Tobago, Belize | 9 |

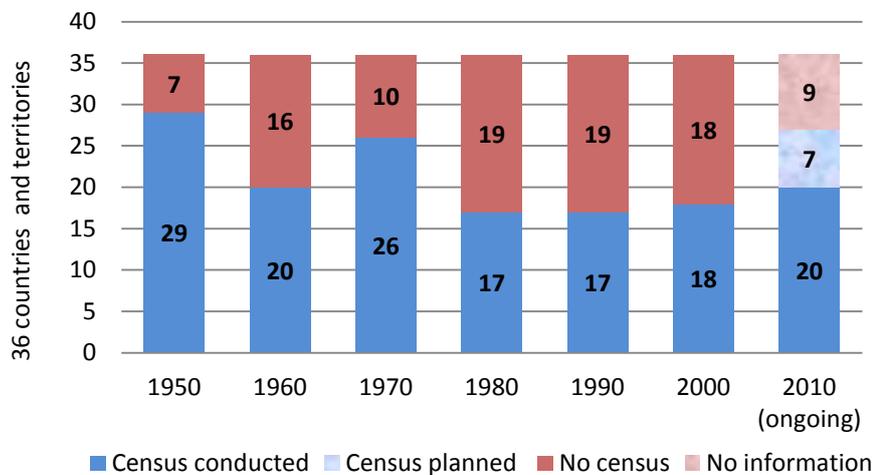
⁴ Latin America and the Caribbean region includes 36 member countries and territories (Only the 33 countries are covered by the FAO Regional Office of Latin America and the Caribbean - FAORLC).

Chart 2. Agricultural Censuses in Latin America and the Caribbean region in the 2010 WCA round (2006-2015)



The Table in Annex 1 shows participation of Latin America and the Caribbean countries in the WCA rounds starting from 1950. The Chart 3 illustrate the distribution of participation of Latin America and the Caribbean countries and territories in various rounds.

Chart 3. Participation of countries in WCA rounds



FAO recommends member countries to conduct a census of agriculture at least once every ten years. A study revealed that only **six** countries in Latin America and the Caribbean region, viz., Argentina, Colombia, Brazil, Jamaica, Mexico, Panama and Venezuela have established regular periodicity⁵. About **19** countries from the region are conducting censuses with some regularity⁶ and the rest of **11** countries are undertaking censuses irregularly⁷.

It was recommended by the 2010 WCA Programme that countries take agricultural censuses as close to 2010 as possible. In Latin America and Caribbean region, Grenada, Haiti,

⁵ Regular periodicity – if the country participated in six or seven complete rounds).

⁶ Some periodicity – if country participated in four or five rounds out of seven complete WCA rounds)

⁷ Irregularly – if it participate in only one, two or three out of seven complete WCA rounds)

Nicaragua, Panama, Peru, Uruguay and the three French overseas departments⁸, Martinique, Guadeloupe, and French Guyana have followed this recommendation and conducted their censuses in the middle of the period (2009-2012). **Eleven** countries have conducted their census in the beginning of the period (2006-2008) and **seven** are planning to conduct one at the end of period (2013-2015). While there may be administrative and financial constraints which decide the timing of the census taking, a convergence in the timing of census taking by different countries increases the international comparability.

III. IMPLEMENTATION OF THE NEW FEATURES OF 2010 WCA IN LATIN AMERICA AND THE CARIBBEAN

3.1 New features of the WCA 2010

The new features recommended by FAO in 2010 WCA Programme include: (1) modular approach which recommends collection of data on key structural variable through a core module by complete enumeration and use of more detailed thematic modules including detailed variables by sampling, (2) integration of the census operation into a comprehensive programme of censuses and surveys, including linkages with population census, and (3) collection of community-level data [FAO, 2005].

The implementation of the WCA 2010 round is still ongoing and not all countries have provided their reports to FAO perhaps because the results are not released yet, so it is too early to present a complete account of the adoption and application of the recommendations on the new features by countries. Nonetheless, a review of experiences of selected Latin America and the Caribbean countries in implementing some new features of WCA 2010 is presented below. Some country examples are presented at the end of the section. These examples may cover more than one feature of the programme.

3.2 Modular approach and integrated approach to survey planning

The modular approach to data collection was advocated as a strategy to meeting increasing data demands from the agricultural census within a budget constraint. The approach can be operationalized in more than one way. One model could be a complete enumeration of agricultural holding for the core structural data item and the specific thematic modules implemented after the census on sampling basis only in selected areas. The other way could be a long-short questionnaire approach. A short questionnaire on core structural variable is answered by all holding, and depending upon the response of to specific question the holding is asked to respond to one or more thematic modules. It is recognized that that there are many other possibilities to creatively optimize the data collection programme, while taking into account required level of reliability and expected level of geographical disaggregation for each data item, budget availability and phasing of workload for data collection and processing. Very few concrete examples were available on use of this approach in the region, at the time of writing the paper.

⁸ These territories have varying legal status and different levels of autonomy, although all (except those with no permanent inhabitants) have representation in the [Parliament of France](#), and consequently the right to vote in elections to the [European Parliament](#).

Selected Country Example

Brazil - Censo Agropecuario 2006. Several census supplementary modules were included in the agricultural census such as: structural aspects of crops and livestock, information of the management of water, use genetically modified organism and the use of alternative agricultural practices, the management of the holding (role of women in farming).

Census included other variables requested for special study or for the development of follow-on surveys. The questionnaire sought information on irrigation, aquaculture, livestock, farm labor, crops, agricultural practices, price and values of agricultural products and land, educational level of farmer, electrical energy use, organic production, investments, income and expenses, debts, and others.

The detailed in-depth questions were asked only to respondents who were a threshold on the basis of response to certain item. For example, the distribution of cattle by age would only be asked to agricultural holdings having at least 50 animals; production practices in permanent crops were inquired only for those holdings having at least 20 trees per species. The use electronic questionnaire facilitated application of threshold and trigger questions. Thus, while all agricultural holdings, livestock, production and trees were registered, most detailed information was asked only from holdings that either specialized in an item or were significant producers of that item. This manner of collecting detailed data from these large, or specialized, farms is similar to the use of census supplementary modules simultaneously with the core census in single field operation.

The more examples on use of modular approach, which could start from use of population census to collect agriculture data, are in the following section.

3.3 Linking Population and Housing Censuses with Agricultural Censuses

The guidelines contained in the WCA 2010 programme and those from United Nations Statistics Division (UNSD) on Population and Housing Censuses advocated for a stronger coordination between the two censuses. The guidelines have been further elaborated in the form a joint publication of FAO and UNFPA entitled, "Guidelines for Linking Population and Housing Censuses with Agricultural Censuses"[FAO/UNFPA, 2012].

Most countries collect basic data on occupation, industry of employment, and status in employment for all members of the households as part of their population census. This information could be useful in identifying the potential households where one or more members may be operating agricultural or aquaculture holding. The coordination between agriculture and population census, extended or otherwise, can take several forms:

- ✓ Use common concepts, definitions and classifications;
- ✓ Sharing field material e.g. boundaries/definitions of enumeration area;
- ✓ Using the data from the population census to provide a frame for the household component of the agricultural census;
- ✓ Making use of agriculture related data from the population census for preparing a sampling design for agricultural census;
- ✓ Collecting additional agriculture related data in the population census;

- ✓ Linking data from the two censuses;
- ✓ Conducting the two censuses as a joint field operation.

Based on a study of population census questionnaires available on the UNSD website and national country websites, a set of countries using population census to collect agriculture data were identified. The questions used by these countries are presented in [Annex 2](#). The conclusion is that the extent of use of population census for collection of agriculture related information varies across countries.

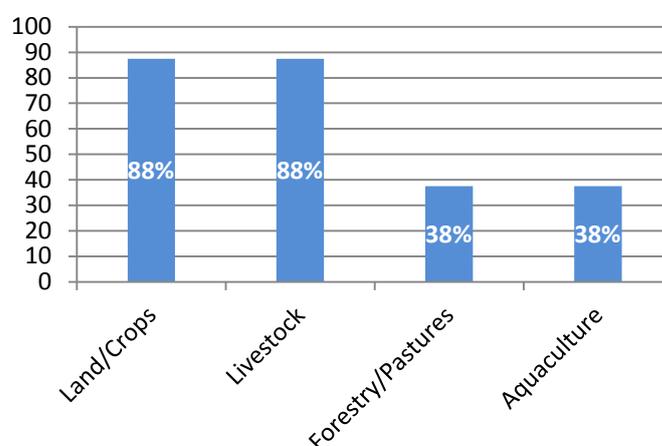
During the current WCA round (2006 – 2015), **eight** countries from Latin America and the Caribbean region have included in their Population and Housing Census questionnaire items related to agriculture. Out of these three are reported to have used the approach of designing their agricultural census based on agriculture related information collected in the population census and these are: El Salvador (2007), Saint Lucia (2007), and Panama (2010).

Two countries Barbados and Belize and have conducted a Population and Housing Census in 2010 and included a section on Agriculture in the questionnaire. The remaining three countries, planning to conduct an Agricultural Census in the near future, which have included limited items on agriculture in their recently conducted Population and Housing Census are:

- ✓ Colombia –Module of agricultural activities (2005-2006)
- ✓ Costa Rica – one question on agriculture (2011)
- ✓ Dominican Republic – two questions on agriculture (2010).

Nonetheless it is clear that most countries collect information on crop/land and livestock. The information on fishery and forestry is perhaps collected keeping in view the relevance of this information for the country. See Chart 4. Out of 8 countries that have included information on agriculture in their population census 7 have collected items on land/crops and livestock. Of these 7 countries that collected information on availability of land intended for farming, only three asked about the area of land, **Colombia, Dominican Republic and Barbados**. Some countries also asked about land tenure. Very few countries collected information on forestry/pasture and aquaculture. **Panama, Colombia and Belize** have asked about fallow farm land and/or pasture land, area of forest planted, and **Colombia, Barbados and Belize** have asked about area and/or type of aquaculture.

Chart 4. Items on agriculture included in population census questionnaire



Selected country example

Panama – Agricultural Census 2011, used the opportunity of Population Census to get information on small scale agricultural practised on household farms commonly known as ‘Huertos caseros’. Such an approach ensured complete coverage of agricultural sector.

Saint Lucia – Census of Agriculture 2007. Data from the 2001 Population and Housing Census along with records from other sources (agricultural extensions officers, farmer associations, etc) served as census frame and the cartography of the Agricultural Census.

Barbados Population and Housing Census 2010 included an agricultural module on Agriculture. The agricultural households were identified during the population census and for each identified agricultural household, the following information were collected:

- ✓ type of agricultural activity involved in (sugarcane farming, vegetable farming, root crop farming, livestock farming, poultry farming, fruit farming, horticulture, fish farming, herbs, cotton, other),
- ✓ main purpose of involvement (for sale, for home consumption, not stated)
- ✓ area of agricultural land by tenure of land,
- ✓ location of land,
- ✓ agricultural land under cultivation,
- ✓ main source of water supply.

3.4 Community-level data

The importance of multi-faceted Community-level data, at the village or the commune level, is being increasingly realised in the countries for assessing the access to infrastructure and services to agricultural holdings, and to support formulating, executing and evaluating community projects. Given the strong demand for data with the communities as statistical unit, a community-level component, with 32 data items, had been included in the WCA 2010 Programme, and countries were encouraged to include this component in their agricultural censuses programmes according to national circumstances and data requirement. The cost of collection of this type of information was foreseen as marginal and far outweighs its benefits.

Selected country example

In Latin America and the Caribbean region three good example of community level data collection as part of agricultural census were identified: Haiti (2008/2009), Nicaragua (2011) and Venezuela (2007). The main data items collected relate to: geographic location, socio economic conditions, community infrastructure and services.

Venezuela collected data from communities in its VII Censo Agrícola Nacional 2007 through a special questionnaire “Cuestionario de micro áreas comunales”. **Micro áreas comunales** (MAC) are defined as the basic spatial units for statistical purposes, determined by the community on the basis of the sense of belongingness of its people and the recognition of others. The items collected through the questionnaire included : location and number of houses and people living in the Micro Communal Areas (MCA), infrastructure and support services to agricultural production, socio-productive projects and aquaculture development, infrastructure of educational, health, availability of services, economic activity, organization , participation, nutrition, health, risks and vulnerabilities.

In IV Censo Nacional Agropecuario 2011 of **Nicaragua** along with the census questionnaire a special questionnaire “boleta comunitaria” designed to gather information on communities was used. The information collected in the community questionnaire were: geographical location of the community, identification of the holder, access roads and community transports, ethnic group and community environment, existence of agricultural services, health services and education.

The community survey of the Agricultural Census of **Haiti** investigated in the first phase of the census, covered all communal sections of the country. Its purpose was first to provide to public authorities, development stakeholders and economic operators with the necessary data for decision making. The information collected will help the local authorities and local stakeholders to better understand the specific of their territory and therefore provide a better understanding of its potential for development and strategies needed to enhance its benefits. The community survey at each communal section level covered: agricultural characteristics, the state of the environment, cultural differences, access to basic infrastructure, services and markets, economic activities and dominant vocations, agricultural employment, social cohesion, food security, development prospects. The community survey was broken down into 17 topics: location and identification panel, main features, agricultural characteristics, state of the environment, roads and isolation, water and electricity, access to infrastructure and basic services, processing units and crafts, main steps of the section, sites, cultural specificities and festivities, economic activities and vocations, access to inputs, credit counseling and agricultural employment, social cohesion, integration and conflict, food security, development prospects, homes and communities in the section.

4.4 New technologies for census data collection

As the complexities in census –taking increase, so does the demand for using new technology. Most countries would need to use new methods of collecting census data, but very few have adopted one due to high cost. In Latin America and the Caribbean region three countries Brazil, Mexico, Venezuela and the three French territories have adopted new technology for data collection in their census operations. Those technologies are the Personal Digital

Assistant (PDAs) integrated with Global Position System (GPS) and Computer Assisted Personal Interview (CAPI).

Selected country example

Brazil – Censo Agropecuario 2006. The agricultural census was part of three data collection operations which were conducted simultaneously in a single field operation: 1. The agricultural land and livestock census, 2. the population count, and 3. the register of addresses of housing units, agricultural and livestock units, health units in rural area in order to build a dereference national register.

In order to reduce costs, time of collection, improve data quality, timeliness of transmission and dissemination of data, Brazil's Institute of Geography and Statistics (IBGE) innovated to use of electronic questionnaire into Personal Digital Assistant (PDAs) - handheld computer, integrated with Global Position System (GPS) to achieve geo-referenced information on all of its approximately five millions farms in the country, covering 8 514 877 km² of geographical area in 5 564 municipalities. A single device was used to collect data for three surveys, by the same enumerator using a structured integrated field operation.

A conclusion of this experience was that PDAs with GPS offer a great advantage to reduce the processing time and dissemination of agricultural census data with geo-referencing of the units visited.

México – VIII Censo Agrícola, Ganadero y Forestal 2007. The collection strategy included two stage field operation:

The objective of the first stage (enumeration phase) was to identify, locate, and delimit lands with and without agricultural or forestry activity on cartographic material using satellite images, as well as obtaining information regarding the producers names and addresses, names of the owners, land tenure and main activity. The information was obtained interviewing the appropriate informants and registering data in a mobile PDA (Personal Digital Assistant) device, in order to have the Directory of Producers associated to the Land Inventory.

The objective of the second stage (data collection phase) consisted in obtaining information on the agricultural and forestry production units. The census data collection was performed through direct interviews with the producers to whom a digital format questionnaire was applied incorporated in a PDA mobile device.

Venezuela – VII Censo Agrícola Nacional 2007, the questionnaires used for the recording of each Agricultural Production Unit (APU), Home of the producer (s) and Micro Communal Area (MAC) were loaded electronically on a Dispositivo Móvil de Captura (DMC) which quickly fill all data and take the geographical coordinates. The device ensured verifying that the enumerator visited that point.

For collection of census data the three French territories **Martinique, French Guyana and Guadeloupe** adopted the Computer Assisted Personal Interviewing (CAPI) procedure.

IV. COVERAGE OF DATA ITEMS

4.1 Coverage of Data Themes

The modular approach of core and thematic modules was intended to provide flexibility to member countries to prepare a phased programme for agricultural census and surveys.

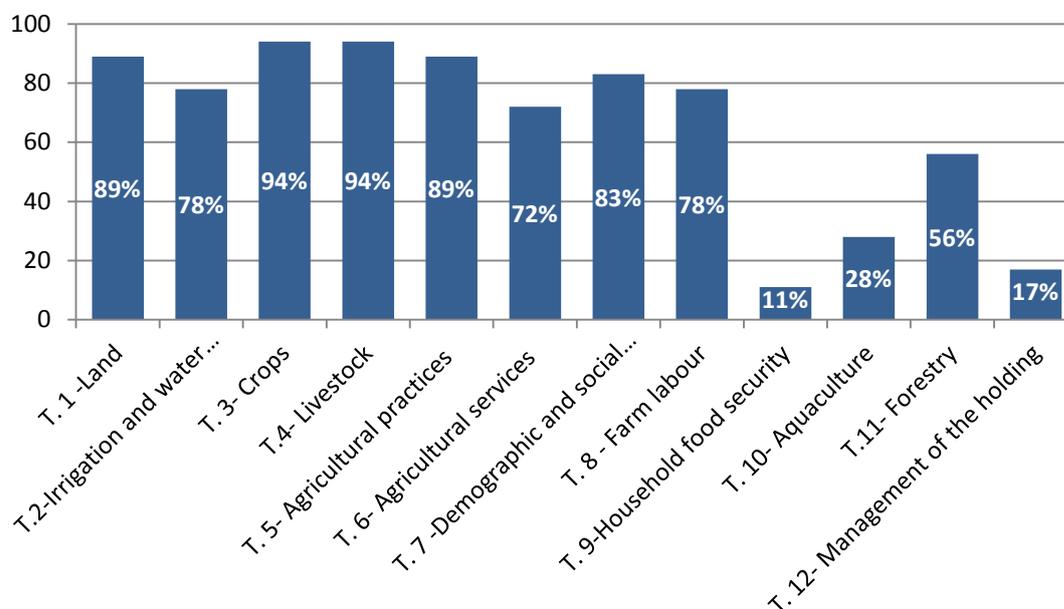
Out of 20 Latin America and Caribbean countries and territories⁹ that have conducted an agricultural census during the current round (WCA 2010), 18 census questionnaires were available to FAO by the time of writing this paper. An analysis of these questionnaires indicated that all countries have included in their censuses the recommended core census items.

The Chart 5 below provides an indication of representation of various themes in the census questionnaire. While most countries include in their censuses themes relating to land, crops, livestock, agricultural practices and services, the themes which seems to be under-represented in the agricultural censuses in Latin America and the Caribbean region are:

- ✓ Theme 09 Household food security
- ✓ Theme 10/11 Forestry and aquaculture may seems to be under-represented, but their importance is not the same for all countries
- ✓ Theme 12 Management of the holding

⁹ Include the three French overseas departments not covered by the FAO Regional Office of Latin America and the Caribbean - FAORLC.

Chart. 5 Items covered in Latin America and the Caribbean region by the 12 themes



4.2 Agricultural services and practices

About 72 percent of countries collected data on “Agricultural services”. Traditional data items on use of fertilizers, pesticides, machinery and equipment, and non-residential buildings along with new items such as use of organic agricultural practices, use of genetically modified crops were combined in a separate theme ‘Agricultural practices’. About 89 percent of countries have collected data on selected items from this theme.

4.3 Household Food Security

Two screening type questions to identify existence of food security at household level were recommended. Only two countries (11 percent of Latin America and the Caribbean countries) Nicaragua and Haiti have collected data on this theme through their agricultural censuses. The reasons for this low acceptance of this type of questions are not well known. Nonetheless, it should be noted that combining of information on food security status of the household with resource endowment and agricultural practices offers a great opportunity to analyse structural causes of hunger in the agricultural households, and offer remedies by way of changes in agricultural practices, particularly for small and marginal farmers whose nutritional status is largely determined by their production.

4.4 Gender and Management of the Holding

Most countries collect data on gender of the holder which provides enormous potential for a detailed gender related analysis of several other structural agricultural variables.

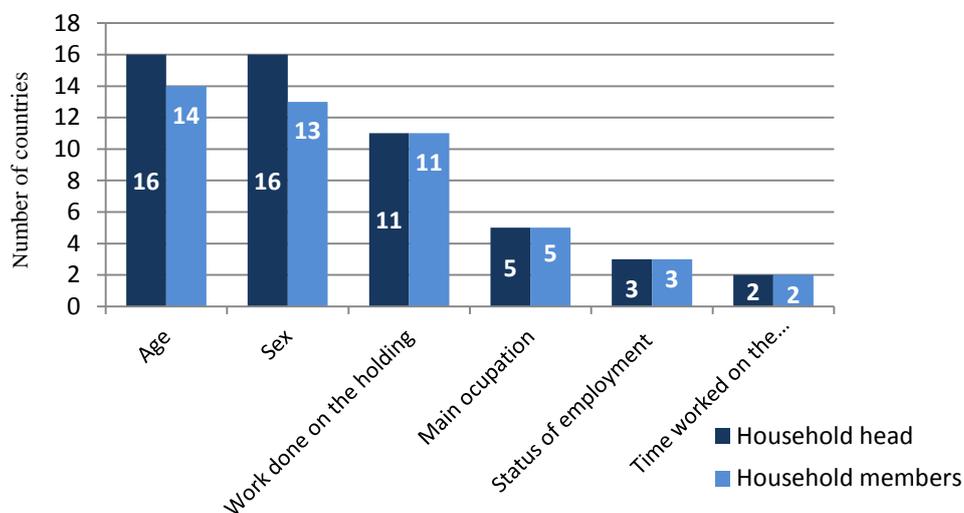
Items on management of the holding (identification of sub-holdings and sub-holders along with their characteristics) is also a new items in the WCA 2010. These items provide useful basis for measuring the role of women in agriculture. During the implementation of WCA 2010, it came out that the concepts of sub-holding and sub-holders are complex and may not be suitable for all countries.

The Chart 5 below provides an indication of representation of various demographic items collected for the household head as well as the members of the household in the census questionnaires. While most countries include in their census questionnaire, information on sex and age of the household head as well as the household members, the items which seems to be under-represented for both household head and members of the household in the agricultural censuses in Latin America and the Caribbean region are: status of employment, time worked on the holding and main occupation. Out of 17 countries providing demographic items 11 have collected information on work done on the holding for both head and members of the household.

Only 5 countries have collected information on **main occupation**, for both **head** and household **members** and these countries are the three French overseas departments (French Guyana, Martinique and Guadeloupe), Antigua and Barbuda, and Paraguay. The questionnaire of the three French overseas departments also include questions on **status of employment**. Antigua and Barbuda, and Paraguay collected information also on **time worked** on the holding **both for head and members** of the household.

Questions on literacy, education level, and nationality were also collected in some countries.

Chart 5. Countries collected demographic information



4.5 Use of agricultural censuses for collecting data on aquaculture and forestry

The recommended list of data items allows countries to include some items concerning aquaculture and forestry. **About 28 and 56 percent** of the countries included in their questionnaires items on aquaculture and forestry, respectively. Out of these countries, some went far beyond the item list recommended in the Programme and included separate sections for forestry activities, depending upon importance of these themes for the country.

Country examples

Mexico during its VIII Censo Agricola, Ganadero y Forestal (2007), investigated agricultural and forestry activities at the same level of details. An entire section for agricultural and forestry activities named "Aprovechamineto forestal" was used to collect information on area of forest land, forest technology and facilities, deforested area by end of use (agriculture use, livestock use and other use), wood products and purpose of production, wild products and species by use.

Chile has included a section on forestry in the questionnaire used for its 2007 Census of Agriculture. The questionnaire collected information on plantations of forest by species (area, group of age, management of forest, non-irrigated area of forest), native forest (area and management), forestry machinery used on the holding.

V. CURRENT ISSUES AND IMPLICATIONS FOR WCA 2020

Agricultural censuses should not only focus of traditional structural data items, they should provide answers to some burning national and international policy issues as well. Planning for each new WCA round provides an opportunity not only to take stock of difficulties of the countries in conducting agricultural censuses, methodical innovations made by countries, but it also is an occasion to take stock of the emerging data needs. The current international agenda places high importance on the issue relating to livelihood and food security of small holders and family farms, capital formation in agriculture and urban agriculture.

5.1 Livelihood Security of Small Holders and Family Farms

The Table 3 below indicates that the structure of agriculture is bipolar: large industrial farm one hand and small subsistence farm on the other hand. Small holdings abound in Asian, Pacific and Caribbean countries (See Annex 2 for details). Their characterization, definitions, identification of Small Farms or Family Farms, and the measurement of their activities is a pre-requisite for preparing policies which promote their welfare, besides development of the agriculture sector.

Countries adopt varying criteria for coverage and classification of agricultural holdings in their census and surveys, which make international comparisons difficult. Often collection, classification and tabulation of data from agricultural census and surveys are not carried out to adequately reflect the role played by small farmers. There is a need to consider requirement of data for policies for small farmers at the time of planning agricultural census and surveys. The marginal cost for provision of such additional data will perhaps not be significant.

Table 3: Average size and fragmentation of agricultural holding during (1995-2005)

| Countries by continent <i>(Number of countries covered is given in parenthesis)</i> | Average area per holding <i>(hectare)</i> | Average number of parcels per holding |
|---|--|--|
| World Total (114) | 5.5 | 3.5 |
| Africa (25) | 11.5 | 3.0 |
| America, North and Central (14) | 117.8 | 1.2 |
| America, South (8) | 74.4 | 1.2 |
| Europe (29) | 12.4 | 5.9 |
| Asia(29) | 1.0 | 3.2 |

It has been observed that given irrigation facilities small agricultural holdings tend to adopt intensive cultivation, growing up to four crops a year, optimizing the land use to improve their household food security situation or to augment their income from agricultural activity.

The livelihood of households dependent on small farms is more susceptible to shocks arising out of vagaries of weather or pest attacks. Due to the subsistence type of agriculture, the small farmer household is more vulnerable to food insecurity situation even in the event of slight drought. Small farmers have fewer coping strategies than medium or large farmers. Small holders usually lack resources to invest in their land or livestock. Many a type of farm technology and machinery are unsuitable for adoption at small scale. Often small scale farms adopt an integrated crop and livestock system. In many countries there may exist specific crop and/or livestock species raised by small farmers, e.g. millets and poultry, pig, sheep and goat rearing. The macro-economic and sectoral policy instruments do not affect the large and the small farmers in the same ways.

The agricultural policies and executive actions cannot be effective if they ignore these features of the agriculture sector, particularly those relating to supply of agricultural inputs, technology dissemination, marketing arrangements and credit. Thus there is a need for information to carry out an analysis of the policy options to evaluate their possible impacts on the well-being of the small farmers, before making a choice.

A review of the definition of agricultural holdings adopted for the agricultural census indicates that countries often adopt an operational definition of agricultural holding for the purpose of census and surveys. While these thresholds may be necessary to keep the workload under a manageable limit and to stay within the budget constraint, the adoption of thresholds in surveys, usually based on scale of operation and/or purpose of production, i.e. size of land plot, number of livestock, participation in market usually leave a part of small scale or family agriculture out of the surveys purview [FAO, 2011]. What is needed is the complete coverage of agriculture activity at the listing stage. Once the complete universe is defined, one can design a separate survey with a small sample and perhaps different questionnaires for small subsistence type farms. The questionnaires for small holdings may need a greater focus on food security, livelihood, social protection, extent of dependence on market for food supplies, alternative sources of employment etc.

5.2 Data on capital formation in agriculture

The investments in agriculture decide the productivity of farm labour and other inputs. These investment can come from both public and private sector initiatives. The public sector capital formation in agriculture mostly comes through government investments in irrigation infrastructure and land improvements. The private sector investments take place in the form of purchase of agricultural machinery, creation of minor irrigation infrastructure such as wells, augmentation of breeding/laying livestock units etc. The availability of data on these aspects is particularly weak and the next programme will need to consider appropriate strategies to improve availability of data on these aspects.

In WCA 2000 round only 36 out of 114 reporting countries around the world have collected data on machinery and equipment. In the current round in Latin America and the Caribbean region out of 18 countries 17 have collected data on stock of machinery as well as the use of machinery. About eight countries have included in their census questionnaire information on the power of tractors also..

Out of 18 countries, 8 countries (**Antigua and Barbuda, Argentina, Brazil, Chile, Nicaragua, Paraguay, Peru and Saint Lucia**) have asked information about manually

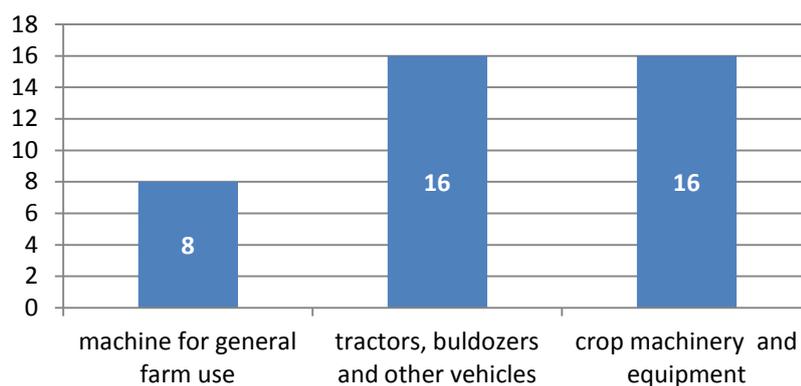
operated equipment, six countries (**Brazil, Chile, Nicaragua, Paraguay, Peru and Venezuela**) have asked about animal - powered equipment, and 16 countries have asked about machine - powered equipment.

The Chart 6 below presents the number of countries that have collected information on machine-powered equipment according to their use. Machine for general farm use were collected in 8 countries: **Antigua and Barbuda, Argentina, Brazil, Chile, Nicaragua, Panama, Paraguay, Saint Lucia**. Information on tractors, bulldozers and other vehicles were collected in 16 countries and on crop machinery and equipment in 16 countries.

Information on special machinery/equipment like aircrafts and aircrafts for agricultural use were collected only in Brazil and Panama (fumigation aircrafts and helicopters), vessels only in Brazil, forestry machinery and equipment in Chile and Mexico, and machinery and equipment by types of livestock in El Salvador and Nicaragua.

As a innovation were collected information on solar panels in Nicaragua and Peru.

Chart 6. Information on Machinery and equipment (out of 18 countries)



5.3 Urban agriculture

In some countries the practice of urban agriculture (back yard farming, kitchen gardens, rooftop gardens etc.) is seen as a viable alternative for providing nutritional security to urban dwellers. It has been observed that many agricultural censuses do not cover urban areas. In case there exists this kind of potential, there would be need to consider coverage of this sector of agriculture in the statistical programme like agricultural censuses. In countries where linkage of population and agriculture census is planned, this could be a feasible method of collecting initial data on this aspects. This initial data could be the basis of designing a small sample in-depth surveys on this aspect.

5.4 Role of Women in Agriculture

Cross-tabulation of census data by sex of holder indeed offers great opportunity to understand the role of women in agriculture. There is greater demand for more sex disaggregated data on agriculture, particularly on ownership of land and time spend on farm activities.

5.5. Issues and Recommendations from Asia

In the twenty-fourth session of the Asia and the Pacific Commission on Agricultural Statistics (APCAS 24) held in 2012, the following issues were emphasised and recommended for consideration in the planning process of WCA 2020:

- a. The resource requirement for conducting the agriculture census due to increasing data demand;
- b. The need for enlarging the scope of integration of agricultural census with other census like economic census;
- c. The issue of including narcotics and medicinal crops, such as poppy and coverage of aquaculture crops to ensure complete coverage of agricultural activity;
- d. Gender and role of women in agriculture;
- e. Indicators related to natural disaster and climate change issues;
- f. The efficiency of data collection with the use of new technologies;
- g. Potential use of administrative data to reduce costs.
- h. Guidance on processing of census data.

VI. GLOBAL OPPORTUNITIES

Global Strategy to Improve Agriculture and Rural Statistics has been prepared to enable countries to collect at least the internationally identified minimum core set of data, which is critical to policy making at national level and global monitoring. At its 41st session in February 2010, the UNSC endorsed the technical content and the strategic directions of the Global Strategy which now has been translated into a Global Action Plan [FAO, 2012]. Following the same logical framework regional implementation plans are being prepared to implement the activities at regional and country level. The support is planned to be provided through research, training and technical assistance.

The main idea of the strategy is to bring together the efforts of the resource partners and the national agencies like National Statistics Office and the Ministries of Agriculture to have a unified vision for development of agriculture statistics. After a country has been selected for activities under the Global Strategy an In-depth Assessment of the existing agriculture statistics system (a kind of SWOT Analysis) will be carried out involving all stakeholders—both users and producers of statistics. This analysis of the national statistics system will provide basis for development of a Sector Strategic Plan for Agricultural and Rural Statistics (SSPARS). This plan will be prepared in a manner that will mainstream agriculture statistics into the National Strategy for Development of Statistics (NSDS). This plan will ensure

alignment of efforts of donors, governments and other stake holders and will provide a road map for development.

At the stage of Country Assessment and at the stage of preparation of SSPARS, it will be important to consider the “architecture of the survey system” in its entirety, including linkages between agriculture census, regular satellite surveys, *ad hoc* surveys and some small sample special studies to generate ratios, coefficients and conversion factors. It will be important to give due consideration to linkage of agriculture surveys with demographic and social surveys. This integrated planning is expected to provide cost-effective solutions to managing large data demands within a budget constraint and will avoid conflicting data. In preparing the national survey calendar, the countries should give due consideration to establishment of master sampling frames and means to keeping it updated, if needed by relying on administrative processes.

The support being provided through methodological research being undertaken under the Global Strategy on the topics like:

- **Identifying the most appropriate master frame for the integrated survey**
- **Improving data collection methods**
- **Improving the methodology for data analysis**
- **Improving the methodology for using administrative data**
- **Identifying appropriate indicators and collection methods for gender –related data ad indicators**
- **Identifying appropriate indicators and collection methods for small –scale fisheries, including subsistence fisheries.**
- **Better integration of geographic information and statistics**
- **Improving the methodology for using remote sensing**
- **Methodology for counting nomadic and transhumant livestock**

is expected to contribute to better planning of agricultural census and surveys in the future.

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Annex 1: Participation of countries from Latin America and the Caribbean region in WCA rounds

| Latin America and the Caribbean region | Round | | | | | | |
|--|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------------------|
| | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010 (ongoing) |
| <i>36 countries and territories</i> | <i>29 censuses</i> | <i>20 censuses</i> | <i>26 censuses</i> | <i>17 censuses</i> | <i>17 censuses</i> | <i>18 censuses</i> | <i>20 conducted, 7 planned</i> |
| Antigua and Barbuda | 1950 ¹⁾ | - | 1973/74 | - | - | - | 2007 |
| Argentina | 1952 | 1960 | 1969 | - | 1988 | 2002 | 2008 |
| Bahamas | 1950 | - | - | 1978 | 1994 | - | - |
| Barbados | 1950 | 1961 | 1971 | 1981 | 1989 | - | - |
| Belize | 1950 ²⁾ | - | 1973/74 | - | - | - | - |
| Bolivia, Plurinational State of | 1950 | 1964 | - | 1979 | - | - | 2013 |
| Brazil | 1950 | 1960 | 1970 | - | 1985 | 1996 | 2006 |
| Chile | 1955 | - | - | - | - | 1997 | 2007 |
| Colombia | 1951 | 1960 | 1970/71 | - | 1988 | 2001 | 2013 |
| Costa Rica | 1950 | 1963 | 1973 | 1983 | - | - | 2014 |
| Cuba | 1952 | - | - | - | - | - | - |
| Dominica | 1950 ³⁾ | - | 1974 | - | 1995 | - | - |
| Dominican Republic | 1950 | 1960 | 1971 | 1981 | - | - | 2012/13 |
| Ecuador | 1954 | 1962 | 1974 | 1984 | - | 1999/00 | 2013/15 |
| El Salvador | 1950 | 1961 | 1971 | - | - | - | 2008 |
| French Guyane (Fr) | - | - | 1972 ⁵⁾ | - | 1989 | 2000 | 2010 |
| Grenada | 1950 ³⁾ | - | - | - | 1995 | - | 2012 |
| Guadeloupe (Fr) | - | - | 1972 ⁵⁾ | - | 1989 | 2000 | 2010 |
| Guatemala | 1950 | 1964 | - | 1979 | - | 2003 | 2013 |
| Guyana | 1950 ⁴⁾ | - | 1968/69 | - | - | - | - |
| Haiti | 1950 | - | 1971 | 1981 | - | - | 2008/09 |
| Honduras | 1952 | - | 1974 | 1980 | 1993 | - | 2013 |
| Jamaica | 1950 | 1961 | 1968/69 | 1978 | - | 1996 | 2007 |
| Martinique (Fr) | - | - | - | - | 1989 | 2000 | 2010 |
| Mexico | 1950 | 1960 | 1970 | 1981 | 1991 | - | 2007 |
| Nicaragua | - | 1963 | 1971 | 1982 | - | 2001 | 2011 |
| Panama | 1950 | 1961 | 1971 | 1981 | 1990 | 2001 | 2011 |
| Paraguay | - | 1961 | - | - | 1991 | - | 2008 |
| Peru | - | 1961 | 1972 | - | 1994 | - | 2012 |
| Saint Kitts and Nevis | 1950 ¹⁾ | - | - | - | 1987 | 2000 | - |
| Saint Lucia | 1950 ³⁾ | - | 1973/74 | - | 1986 | 1996 | 2007 |
| Saint Vincent and the Grenadines | 1950 ³⁾ | - | 1972/73 | - | 1986 | 2000 | - |
| Suriname | - | 1959 | 1969 | 1980 | - | - | 2008 |
| Trinidad and Tobago | 1951 | 1964 | - | 1981 | - | 2004 | - |
| Uruguay | 1951 | 1961 | 1970 | 1980 | - | 2000 | 2011 |
| Venezuela | 1950 | 1961 | 1971 | 1980 | - | 1996-1997 | 2007 |

- 1) Then part of the Windward Islands.
- 2) Then called British Honduras.
- 3) Then part of Leeward Islands.
- 4) Then called British Guinea.
- 5) Then part of the French Antilles.

Annex 2. Examples of practices in Latin America and the Caribbean countries on inclusion of additional agricultural questions in the Population and Housing Censuses

| WCA 2010 ROUND | |
|--|---|
| COUNTRY (CENUS YEAR): <i>(under revision)</i> | |
| BARBADOS (2010) | |
| Q1. | Are you involved in any agricultural activity? <i>(Yes/ No/ Not stated)</i> |
| Q2. | Do you own any agricultural land? <i>(Yes/ No/ Not stated)</i> |
| Q3. | What is your area of involvement in agricultural activity? <i>(1) Farmer (2) Processor (3) Backyard gardener/Landless farmer</i> |
| Q4. | In what type of agricultural activity are you involved? <i>(1) Sugarcane farming (2) Vegetable farming (3) Root crop farming (4) Livestock farming (5) Poultry farming (6) Fruit farming (7) Horticulture (8) Fish farming (9) Herbs (10) Cotton (11) Other</i> |
| Q5. | What is your main reason for your involvement in agricultural activity? <i>(1) For sale (2) For home consumption (3) Not stated</i> |
| Q6. | What is your land tenure? <i>(1) Own (2) Rent (3) Lease (4) Rent free</i> |
| Q7. | What is the total area of the agricultural land owned by you? _____ <i>(1) Sq Ft (2) Sq M (3) Acres</i> |
| Q8. | What is the total area of agricultural land that you rent, lease, or operate rent free? _____ <i>(1) Sq Ft (2) Sq M (3) Acres</i> |
| Q9. | In which parish is the land located whether owned, rented, leased or rent free? <i>(1) St. Michael (2) Christ Church (3) St. Philip (4) St. James (5) St. Thomas (6) St. George (7) St. Josef (8) St. John (9) St. Andrew (10) St. Peter (11) St. Lucy</i> |
| Q10. | Is the agricultural land under cultivation? <i>(1) Yes (2) No (3) Don't know (4) Not stated</i> |
| Q11. | What is your main source of water supply? <i>(1) Private well (2) Dam (catchment) (3) Stream (4) BWA (5) BADMC irrigation (6) Other (7) None (8) If other, state _____</i> |
| BELIZE (2010) | |
| Q1. | Do you or any member of your household own or lease any land that is currently being used, or is intended for farming? <i>(Yes/ No/Don't know-Not stated)</i> |
| Q2. | Do you or any member of your household engage in any of the following agricultural activities? <i>a) Grow more than 0.5 acre of crops b) Own 2 or more sheep, goats, pigs, heads of cattle (combined) c) Own 10 or more chickens, ducks, turkeys, geese (combined) d) Have any aquaculture ponds for farming fish e) Have more than 0.5 acre of fallow farm land and/or pasture land f) Engaging in fishing as major source of income g) Have 5 or more fruit trees (Yes/No/Don't know-Not stated)</i> |
| BRAZIL (2010) | |
| Q1. | Did you work in any agricultural, animal breeding or fishing activities for only household members' consumption? (including hunting and vegetal extraction) <i>(Yes/ No)</i> |
| COLOMBIA (2005-2006) | |
| Q1. | What is the location of the farm? _____ |
| Q2. | What is the name of the farm, ranch, dairy? _____ |
| Q3. | What is the area of the farm, ranch, dairy? _____,_ <i>(1) Hectares (2) Fanegada?? (3) Block (4) Sq. M (5) Rope??</i> |

Q3. What crops were planted or will be planted on the land of this property during year 2005?

- (1) Name of the crop _____
- (2) Surface unit _____
- (3) Total are sown _____
 - a. In the first semester (short-cycle crops)
 - b. In the second semester (short-cycle crops)
 - c. Day of the interview (long-cycle crops)
- (4) No sowed

Q3. On the census day, on the land of this property existed:

- a) Planted forests? (Yes/ No)

If "Yes"

 - (1) Unit area code _____
 - (2) Total area _____
- b) Forages or pasture?(Yes/No)

If "Yes"

 - (1) Unit area code _____
 - (2) Total area _____
- c) Weeds or stubble?(Yes/No)

If "Yes"

 - (1) Unit area code _____
 - (2) Total area _____

Q4. On the census day, this property had:

- a) Cows, bulls, steer, calves, calves, bullocks, heifers, and buffalo? (Yes/No)
 - b) Horses, mares, mules?(Yes/ No)
 - c) Donkeys, asses? (Yes/No)
 - d) Sheep, lambs, camuros?(Yes/No)
 - e) Goats? (Yes/No)
 - f) Pigs and piglets? (Yes/No)
 - g) Chickens, roosters, hens? (Yes/No)
 - h) Other minor species (turkeys, guinea pigs, rabbits, quail, hives)? (Yes/No)
- If "Yes" please write the total for each.

Q5. On the day of the census, what is the area on which this property grows:

- a) Fish? (Yes/No)

Unit area code __

Total area __
- b) Shrimps? (Yes/No)

Unit area code __

Total area _____

COSTA RICA (2011)

Q1. Anyone in this household...

- (1) ... has agricultural field or farm?
- (2) ... planted crops during the past year? (on land owned, rented, loaned)
- (3) ... has cattle, pigs, chickens, ducks, turkeys, gees, other? (for sale or own consumption)
- (4) None of the above.

DOMINICAN REPUBLIC (2010)

Q1. Does someone living in this household has planted land or harvested during the last 12 months?

- (1) Yes → Please tell me the names of those persons

How much planted land has (name)?

How much harvest has (name) during the last 12 months?
- (2) No

Q2. Does someone living in this household has some animals for own consumption or for selling?

- (1) Yes → Please tell me the names of those persons

(1.1) How many cows, bacerros, bulls or steers has (name)?

(1.2)How many sheep and goats has (name)?

(1.3) How many ducks, turkeys and geese has (name)?

(1.4) How many hens or chickens and guineas has (name)?

(1.5) How many pigs has (name)?

(1.6) How many bee hives has (name)?

(2) No

EL SALVADOR (2007)

Q1 Any member of this household has as main activity:

a) Cultivation of basic grains, vegetables, coffee, etc.? (Yes/ No)

b) Animal (livestock) growing? (Yes/No)

Q2. The land where you plant crops or grow animals is:

(1) Own (2) Rented (3) Other

PANAMA (2010)

Q1. Here or elsewhere, any person living in this household:

a) Planted any kind of grains (rice, corn, beans or other), cassava, yams, taro, vegetables, cane or other crops in 2009? (Yes/ No)

b) Has plants or fruit trees or timber or pasture? (Yes/ No)

c) Has medicinal or ornamental plants for commercial purpose? (Yes/ No)

d) Has cattle, pigs, horses, mares, mules, male donkeys, sheep, and goats? (Yes/ No)

e) Has breeding chickens, ducks, geese, turkeys, quail or hives? (Yes/ No)

Annex 3. Average size of agricultural holding during (1995-2005) in Latin America and the Caribbean region.

| <i>36 countries and territories</i> | <i>Total number of holdings (units)</i> | <i>Total area of holdings (ha)</i> | <i>Average area per holding (ha)</i> |
|--|---|------------------------------------|--------------------------------------|
| <i>0</i> | <i>1</i> | <i>2</i> | <i>4</i> |
| <i>Totals LAC (18 countries covered)</i> | 10 417 987 | 675 181 622 | 64.81 |
| <i>Totals LA(11)</i> | 9 372 572 | 619 515 335 | 66.1 |
| <i>Total C (7)</i> | 8 336 619 | 615 280 691 | 73.8 |
| Argentina | 295 485 | 172 105 798 | 582.5 |
| Brazil | 4 859 865 | 353 611 246 | 72.8 |
| Chile | 316 492 | 26 502 363 | 83.7 |
| Colombia | 2 021 895 | 50 705 453 | 25.1 |
| Ecuador | 842 882 | 12 355 831 | 14.7 |
| French Guyane (Fr) | 5 318 | 34 655 | 6.5 |
| Guadeloupe (Fr) | 12 160 | 41 700 | 3.4 |
| Guatemala | 830 684 | 3 750 855 | 4.5 |
| Jamaica | 187 791 | 407 434 | 2.2 |
| Martinique (Fr) | 8 039 | 32 041 | 4 |
| Nicaragua | 199 549 | 6 254 514 | 31.3 |
| Panama | 236 794 | 2 769 529 | 11.7 |
| Saint Kitts and Nevis | 3 066 | 6 369 | 2.1 |
| Saint Lucia | 13 366 | 20 770 | 1.6 |
| Saint Vincent and the Grenadines | 7 380 | 7 199 | 1 |
| Trinidad and Tobago | 19 111 | 84 990 | 4.4 |
| Uruguay | 57 131 | 16 419 683 | 287.4 |
| Venezuela | 500 979 | 30 071 192 | 60 |