

**A system of integrated
agricultural censuses
and surveys**

Volume 1

**World Programme for the
Census of Agriculture
2010**

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FOREWORD

The FAO constitution states that the organization shall collect, analyse, interpret and disseminate information relating to nutrition, food and agriculture. Since its establishment, FAO has cooperated with member countries to improve the coverage, consistency and quality of food and agricultural statistics and has established an on-line database of agricultural statistics.

One of the important elements of FAO's statistical work is the promotion of the decennial World Programme for the Census of Agriculture. There have now been eight rounds of agricultural censuses and, since its founding in 1945, FAO has been responsible for preparing the guidelines on concepts, definitions, classifications and methodology to help countries plan and carry out their census of agriculture. FAO also summarizes the results of the agricultural censuses undertaken around the world, and these summaries are available on the Internet.

Each round of agricultural censuses covers a ten-year period. The present publication presents guidelines for the 2010 round of agricultural censuses, covering agricultural censuses to be undertaken between 2006 and 2015. For this round, a new approach is being used, with the emphasis on conducting agricultural censuses within the framework of the system of integrated agricultural censuses and surveys and in the broader context of the national statistics system.

It is envisaged that countries will undertake their agricultural census in modules, rather than as a single one-off operation. The core module, preferably based on complete enumeration, will cover a limited range of key data required by national policy-makers and for sample frame construction. One or more sample-based supplementary modules will then be implemented as part of the agricultural census to provide more detailed structural data. This approach will reduce costs and allow countries to collect a greater range of data than in previous censuses. The new programme also provides for the collection of infrastructure data at the community level.

The new programme recognizes the high cost of conducting an agricultural census and places emphasis on coordinating the agricultural census with other censuses, especially the population and housing census. Considerable cost savings and added value can be gained by such an approach.

FAO plans to issue a series of publications on agricultural censuses and surveys, covering the whole range of statistics needed for agricultural policy-making and planning. This publication is the first in this series.

Director
Statistics Division

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ABBREVIATIONS

CPC	Central Product Classification
EA	Enumeration area (for use in a census or survey enumeration)
FAO	Food and Agriculture Organization of the United Nations
GAP	Good Agricultural Practices
GM	Genetically modified
HS	Harmonized Commodity Description and Coding System
ICC	Indicative Crop Classification
IIA	International Institute of Agriculture
ILO	International Labour Organization
IPM	Integrated Pest Management
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification of all Economic Activities
LSMS	Living Standards Measurement Survey
MDGs	Millennium Development Goals
SNA	System of National Accounts
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCA	World Programme for the Census of Agriculture

PART ONE

WORLD PROGRAMME FOR THE CENSUS OF AGRICULTURE 2010

CHAPTER 1

INTRODUCTION

This chapter provides a historical background on the World Programme for the Census of Agriculture 2010, and outlines the basic characteristics of the new approach for the 2010 round of agricultural censuses covering the period 2006–2015. The new programme uses a modular approach, with a core module carried out on a complete enumeration basis to provide key structural data in conjunction with one or more sample-based census supplementary modules to provide more in-depth data. The integration of the census of agriculture into the overall system of agricultural statistics is emphasized. The changes from earlier agricultural census programmes are also highlighted.

What is a census of agriculture?

1.1. 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. In an agricultural census, data are collected directly from agricultural holdings, but some community-level data may also be collected. A census of agriculture normally involves collecting key structural data by complete enumeration of all agricultural holdings, in combination with more detailed structural data using sampling methods.

Background to the world programme for the census of agriculture

1.2. This publication presents guidelines for the World Programme for the Census of Agriculture 2010 (WCA 2010), covering agricultural censuses to be carried out by countries between 2006 and 2015. It is the ninth round in the decennial programme of agricultural censuses, which started in 1930. The 1930 and 1940 rounds were sponsored by the International Institute of Agriculture (IIA). The six subsequent rounds – in 1950, 1960, 1970, 1980, 1990 and 2000 – were promoted by FAO, which assumed the responsibilities of IIA following its dissolution in 1946.

1.3. The first two rounds of the agricultural census sought to provide comprehensive agricultural statistics, including production. For the 1930 round, countries were asked to carry out a national agricultural census during 1929 in the northern hemisphere, and during 1930 in the southern hemisphere. The objective was to obtain global data referring to the same time period. A similar request was made for the 1940 round. These first two rounds were undertaken at a time when there was a large gap in agricultural information, and data sources for agricultural statistics were not well organised, even in developed countries. The agricultural censuses were expected to help fill this gap. However, many countries found it difficult to conduct the census. Adequate resources for maintaining a large field staff were not easily obtained; their recruitment and training were major concerns when professional staff were limited in number; and, completing long questionnaires was a burden for both enumerators and respondents. It was difficult to guarantee data quality, and data processing in the pre-computer era was very time-consuming. For these and other reasons, the first two census rounds proved to be beyond the capacity of many countries.

1.4. The 1950 round provided for a more restricted content, concentrating on the structural aspects of agriculture such as farm size, land use and numbers of livestock. Later rounds retained this focus on structural data, but gradually expanded the census content to reflect current areas of concern; the 2000 round gave special emphasis to aquaculture, employment and the environment. The requirement to undertake censuses in all countries in the same year was also relaxed; the 2000 round covered agricultural censuses taken during the period 1996–2005.

1.5. In implementing agricultural censuses, governments around the world have increasingly had to balance the need for statistical information against the resources required to produce the statistics. A census of agriculture is very costly as well as being highly demanding on technical and other resources. More and more, governments are under pressure to cut the costs of providing statistical services. Some countries have not had the manpower or financial resources to carry out a full census of agriculture, but have been able to participate in the agricultural census programme by using a sample-based approach.

1.6. At the same time as governments face pressure to cut costs, they are also being confronted with increasing and more complex demands for data. There has been growing interest in topics such as food security, the environment, farm labour, and special agricultural practices like organic farming. Where statistical systems are not well developed, there has also been a tendency to use the opportunity provided by the census of agriculture to collect a wider range of data than would normally be the case in such a census. Meeting these additional data needs without over-burdening the census of agriculture has become a dilemma for many countries, especially given the complexity of many of the new topics. The questions needed to adequately cover topics such as farm labour and household food security are too detailed for a census of agriculture in its current form.

1.7. In developing the series of agricultural census programmes, FAO has recognized that countries are at different states of economic and statistical development. Countries have been encouraged to develop and implement their census of agriculture tailored to their unique situation, but to be mindful of the need to collect a minimum set of data for international comparison purposes.

The census of agriculture in an integrated agricultural statistics system

1.8. In recent years, increasing efforts have been made towards the better integration of statistical activities. Integration, in a statistical sense, means that each statistical collection is carried out, not in isolation, but as a component of the national statistics system. In an integrated agricultural statistics system, the census of agriculture provides certain types of data as part of an integrated set of data on food and agriculture, needed for decision-making in food, agriculture and rural development.

1.9. The main advantages of an integrated statistics system are:

- It is possible to plan and develop a comprehensive statistical programme, without duplication of statistical activities or the release of conflicting statistics, while ensuring the efficient and balanced use of available statistical resources.
- Concepts, definitions and classifications used in the different statistical activities can be made compatible, making it easier to interpret and analyse related data from different sources.
- Any one statistical collection, such as the census of agriculture, can be restricted to a coherent and manageable set of items, in the knowledge that other related data are available in a comparable form from other sources.

1.10. The data requirements on food and agriculture in an integrated statistics system are extensive and include data on: the structure of agricultural holdings, agricultural production, farm management, food consumption, household income and expenditure, labour force, and agricultural prices. These data could come from agricultural censuses, agricultural surveys, population censuses and surveys, administrative records, or other sources. An integrated agricultural statistics system involves a multi-year programme of statistical activities, including an agricultural census and agricultural surveys, to provide all the required data.

1.11. Planning and implementing an integrated agricultural statistics system requires an efficient organization, trained personnel at various levels, and secured budgetary allocations over a period of years. Efficient organization implies strong cooperation between users and producers of agricultural statistics. Different statistical activities are not always all under the jurisdiction of a single government institution: for example, the national statistics office is often responsible for the agricultural census, whereas the ongoing agricultural production surveys are carried out by the relevant ministry. In these circumstances, establishing

coordination among the various agencies is paramount. This is sometimes difficult because each agency may have different mandates regarding the purpose, scope and timing of their work.

1.12. Many countries experience a shortage of trained statistical personnel and/or insufficient funds for statistical development, and will require time to achieve an integrated statistics system. Nevertheless, it is recommended that all statistical development efforts be oriented towards the long-term goal of providing a continuous flow of timely and accurate data covering all aspects of food, agriculture and rural development.

1.13. Agricultural censuses and agricultural surveys are closely related in that both involve the collection of agricultural data from agricultural production units. For WCA 2010, emphasis has been given to developing the agricultural census within the overall framework of the system of integrated agricultural censuses and surveys. 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.

1.14. This publication focuses mainly on the agricultural census element of the system. The programme of agricultural surveys is briefly discussed in Chapter 9. Further information on these surveys will be provided in later volumes.

Outline of WCA 2010

1.15. In the past, agricultural censuses have been mainly concerned with the collection of structural data for agricultural production units (agricultural holdings). The 2010 programme continues in this vein. Guidelines for taking agricultural censuses for agricultural production units are given in Chapters 2 to 6 of this publication. However, it is recognized that some countries may wish to collect a wider range of data than in the past and two options are provided:

- Aquaculture is becoming increasingly important in many countries. The option to conduct an aquacultural census in conjunction with the agricultural census is provided. This is discussed in Chapter 7.
- Some countries might like to provide additional agriculture-related data for households that are not agricultural producers but are involved in agriculture in some way, such as those living in rural areas or those deriving income from employment in agriculture. This option is discussed in Chapter 8.

1.16. To help countries meet the need for a wider range of data from the agricultural census, while minimizing the cost of census-taking, it is recommended that countries use a modular approach for the agricultural census:

- A core census module, to be conducted on a complete enumeration basis¹, will provide a limited range of key structural items of importance for national policy-making, making international comparisons, constructing sampling frames, and analysing data at detailed geographic or other levels. The core module is similar to the conventional agricultural census in the past, but with a much more restricted range of items.
- One or more census supplementary modules, to be conducted on a sample basis at the same time as, or immediately after, the core census module to provide more detailed structural data or data not required at lower administrative levels. The sample for the census supplementary modules will be selected based on sampling frames from the core census module. For information on how supplementary modules are conducted in conjunction with the core census module, see paragraphs 3.75–3.76. For information on the sample selection for supplementary modules, see paragraphs 10.12–10.15.

1.17. A recommended list of 16 items for the core module is given in Chapter 4. These items are FAO's recommended minimum set of data for the agricultural census. Countries may include more core items to

¹ For countries where a complete enumeration is not possible, the core module can be conducted on a large sample basis (see paragraphs 3.64–3.71).

meet additional data needs or for use in creating sampling frames for the census supplementary modules or the programme of agricultural surveys. For example, if an in-depth survey on fertilizers was to be conducted, an additional item on the use of fertilizers may be added to the core module to help select the sample for the fertilizer survey.

1.18. Chapter 4 also provides a list of 89 items that could be considered by countries for inclusion in the census supplementary modules. Countries are not expected to carry out all agricultural census supplementary modules or collect all 89 census supplementary items. Instead, each country will conduct one or more supplementary modules according to their requirements. For example, if irrigation and livestock are important to a country, it would carry out the core census module plus two supplementary modules on irrigation and livestock.

1.19. For information on the criteria used to determine the suitability of items for the core and supplementary modules, see paragraphs 3.16–3.21. Concepts and definitions for each core and supplementary item are provided in Chapter 11.

1.20. A schematic representation of the agricultural census within the framework of the system of integrated agricultural censuses and surveys is shown in Figure 1.1. It shows items under selected headings or themes such as “land” and “irrigation and water management”, according to their suitability for inclusion in the agricultural census core module, in the agricultural census supplementary modules, or in the programme of agricultural surveys.

1.21. As well as holding level data, provision is also made for the collection of infrastructure data at the community level, an important need in many countries. Guidelines are provided in Chapter 5.

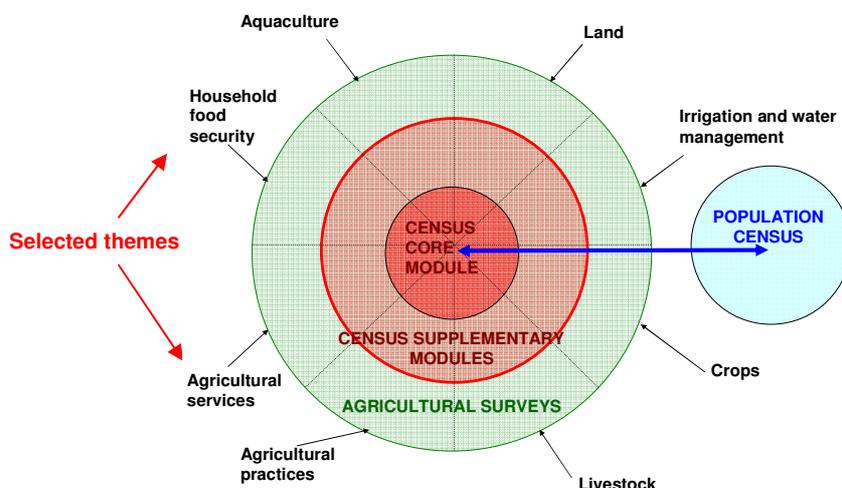
1.22. Emphasis is also given to integrating the agricultural and population censuses, not only through the use of standard concepts and definitions and sharing field materials, but also coordinating the two data collection activities, adding agriculture-related questions to the population census, and linking of data from the two sources. For more details, see Chapter 6.

1.23. Some features of the new agricultural census methodology have already been implemented by countries in previous agricultural census rounds. As in the past, it is expected that countries will adapt the guidelines given in this publication to meet national needs.

Changes from earlier agricultural census programmes

1.24. WCA 2010 has been developed after a review of country experiences with the 2000 programme and an assessment of changing data needs in the light of developments in agricultural practices.

Figure 1.1: The agricultural census in the framework of the system of integrated agricultural censuses and surveys



1.25. The main methodological differences between the 2010 and 2000 programmes are highlighted in the previous section (see paragraphs 1.15–1.23). Specific changes to statistical units, data content, concepts and definitions, and classifications are summarized below:

1.26. Statistical unit

- The statistical unit for the agricultural census, the agricultural holding, remains the same as used in previous programmes (see paragraph 3.23).
- The concept of an aquacultural holding has been introduced as the unit of aquacultural production in the aquacultural census (see paragraphs 7.9–7.11).
- Two new concepts – the sub-holding and the sub-holder – have been introduced to better measure the role of household members in the management of the holding, especially women (see paragraphs 3.42–3.52).

1.27. Data content

- In the 2000 programme, FAO provided a list of recommended items, with some denoted as “Essential”. The 2010 programme presents items under two headings according to their suitability for the core and supplementary modules.
- The list of recommended core items is shorter than the list of essential items from the 2000 programme. However, under the modular approach, a greater range of in-depth data can be collected in the supplementary modules using sampling methods. An extensive, but not exhaustive, list of items for consideration for the supplementary modules is provided.
- A number of items in the supplementary modules are included in the agricultural census programme for the first time:
 - Land: land clearance (Item 0106); soil degradation (Item 0111).
 - Water: irrigation according to land use type (Item 0201); method of irrigation (Item 0202); area of specific crops irrigated (Item 0203); source of water (Item 0204); payment terms for irrigation (Item 0205); other water management (Item 0206).
 - Crops: end-use of crops (Items 0302 and 0313); crop production (Items 0303 and 0314); net cropped area (Item 0321); fertilizer use for each crop type (Item 0323); source of seed (Item 0324); type of seed (Item 0325); area of nurseries (Item 0326).
 - Livestock: use of veterinary services (Item 0402); milking animals (Item 0413); livestock population dynamics (Items 0414–0418); type of feed (Item 0419).
 - Agricultural practices: use of agricultural chemicals (Item 0501); good agricultural practices (Item 0502); organic farming (Item 0503); genetically modified crops (Item 0504); sales of agricultural produce (Item 0507).
 - Agricultural services: credit (Items 0601–0604); source of agricultural information (Item 0605); extension services (Item 0606); access to food markets (Item 0607).
 - Demographic and social characteristics: national/ethnic group (Item 0702); household structure (Item 0713)
 - Farm labour: activity status of household members (Item 0801), status in employment of household members (Item 0811); time worked of household members in main job and on the holding (Items 0813–0814); form of payment for employees (Item 0822); use of agricultural service establishments (Item 0823).
 - Household food security: a new agricultural census theme altogether (Items 0901–0911).
 - Aquaculture: type of site (Item 1001); production facility (Item 1002); type of water (Item 1003); sources of water (Item 1004); type of organism (Item 1005).
 - Forestry: purpose of forest (Item 1103); agro-forestry (Item 1104).
 - Management of the holding: a new theme altogether (Items 1201–1214).
- Several non-essential items from the 2000 programme have been omitted from the 2010 programme; namely, presence of a hired manager, area with irrigation potential, soil type/colour/depth and value of forestry/fishery sales.

1.28. Concepts and definitions

- The definition of an agricultural holder has been amended to allow for the possibility of the holder being a group of people (see paragraphs 3.36–3.41).
- Forest and other wooded land has been re-defined to bring it into line with international standards. The notion of forest and other wooded land as a primary and secondary land use has also been introduced in accordance with international definitions (see paragraph 11.35).
- The notion of “legal” and “non-legal” has been introduced into the land tenure concept to address the issue of security of tenure (see paragraphs 11.47–11.49).
- The definition of irrigation has been clarified to reflect the “controlled” supply of water, and the concept of “water management” has been introduced to provide a more complete picture of water issues on the holding (see paragraphs 11.68–11.72).
- The concept of fertilizer has been clarified to meet with FAO standards. Other organic materials that enhance plant growth but do not come under the definition of fertilizer are also included (see paragraphs 11.130–11.137).
- The concept of “agricultural household” has been introduced to distinguish between holdings that are primarily agricultural producers and those for which agricultural production is a secondary activity (see paragraphs 11.210–11.214).
- Employment concepts have been changed to better reflect the structure of employment in rural areas and to be consistent with ILO standards (see paragraphs 11.226–11.233).

1.29. Classifications

- The land use classification has been changed to clarify land use terminology (see paragraphs 11.20–11.39).
- The crop classification has been updated to make it more suitable for current needs (see Appendix 3).
- For the first time, structured classifications have been provided for types of livestock (see Appendix 5) and types of machinery (see Appendix 6).

Data items and questionnaires

1.30. The purpose of this publication is to present broad principles and guidelines for the 2010 round of agricultural censuses. It makes recommendations on the items to be included in the census and the concepts and definitions to be used. It does not make recommendations on the questions to be asked in the questionnaire to collect those data. Each country needs to develop its own questionnaires and field procedures to collect the data in a manner suited to national conditions, based on the recommended concepts and definitions provided in this publication.

1.31. Often, several questions are required to provide a given agricultural census item. Some items, such as activity status (Item 0801), involve abstract concepts, which cannot be collected directly from respondents. For example, one cannot ask a person if he/she is unemployed; instead, one asks a series of questions about the person’s work activities to determine if the person satisfies the conditions for unemployment (see paragraph 11.237).

1.32. The willingness and ability of respondents to supply information also influences the way questions are asked. For example, to collect data on farm area, one may need to ask questions about the different types of land (to ensure that it is fully reported), to use local units (if the respondents are not familiar with hectares), or to ask specific questions about land registration documents for each member of the household (if land is registered in different names).

CHAPTER 2

IMPORTANCE OF THE CENSUS OF AGRICULTURE

This chapter examines why it is important for a country to undertake a census of agriculture. The uses of agricultural census data in a variety of economic and social fields are described. Special emphasis is given to the use of agricultural census data to help in monitoring progress towards the Millennium Development Goals, and in analysing poverty, food security and gender issues. Using agricultural census data for planning and policy-making in other areas is examined and examples are provided. The use of agricultural census data for improving current agricultural statistics is also highlighted.

Introduction

2.1. Statistical needs for agricultural planning and policy-making are very broad. The primary needs are 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. Current agricultural statistics are usually collected through administrative reporting systems and/or through sample surveys. 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.

2.2. Countries also have other agricultural information needs, apart from current agricultural statistics. A census of agriculture provides fundamental data on the organizational structure of agricultural holdings, such as farm size, land use, land tenure, livestock numbers, and the use of machinery, as well as the number of holdings with each crop and livestock type. Structural information of this type has a wide range of uses, which are examined in this chapter.

2.3. One feature of a census of agriculture is that it involves the collection of data at the individual holding level. Many countries compile current 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 reporting 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 in providing a statistically sound source of agricultural statistics.

2.4. Another advantage of a census of agriculture over administrative reporting is the wider range of data that can be produced. 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 totals for crop area. 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 would 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 any specific geographic area, even non-standard groupings. These aspects greatly enhance the usefulness of agricultural census data.

Monitoring the Millennium Development Goals

What are the Millennium Development Goals?

2.5. In the United Nations Millennium Declaration of 2000, governments around the world committed themselves to sustainable economic growth, focusing on the poor and with human rights at the centre. The Declaration called for combating poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women.

2.6. To help track progress in meeting the commitments of the Declaration, a set of time-bound and measurable Millennium Development Goals (MDGs) was developed. The MDGs comprise a framework of 8 goals, 18 targets and 48 indicators to be used to assess progress between 1990 and 2015, when targets are expected to be met. Monitoring of the MDGs will be done through the 48 basic MDG indicators, supplemented by other background data to provide for more in-depth analysis. For more information on the MDG indicators, refer to *Indicators for Monitoring the Millennium Development Goals – Definitions, Rationale, Concepts and Sources* (UN, 2003).

MDG indicators

2.7. Country-level monitoring of the progress towards the MDGs has become an important element in formulating economic development strategies, and countries have begun to focus on the need for MDG-related indicators as a key component of the national statistical programme. A variety of data sources are being sought for this purpose. A census of agriculture is one of the largest national statistical collections undertaken by a country, and its use as a source of data for monitoring the MDGs should be taken into consideration in the census planning and design.

2.8. The new modular approach used for the current round of agricultural censuses, based on the census core and supplementary modules together with the programme of agricultural surveys, enhances the usefulness of the agricultural census/survey programme as a source of data for MDG monitoring. Countries could look to carrying out regular agricultural surveys, based on the agricultural census frame, to provide additional MDG-related data to complement the data collected in the agricultural census. For example, the decennial agricultural census could provide basic gender indicators (such as sex of holder or sub-holder) for each district or village, while annual agricultural surveys could provide more in-depth gender-related data (such as activity status by sex) at the national level.

2.9. Coordinating the agricultural census with the population census may also provide opportunities for a wider range of data for monitoring the MDGs. Population censuses provide a lot of data specific to the MDG indicators, such as child mortality, school enrolment, the gender indicators, and perhaps even income/poverty and literacy. If the agricultural census data could be linked to the population census data, it would open up the possibility of providing these MDG indicators for specific groups of farm households. For example, child mortality and poverty/income indicators could be available for different types of farm households, such as rice farmers, livestock holdings, and small/large holdings.

2.10. One problem in using the agricultural census for monitoring the MDGs is that it normally covers only agricultural holdings. Thus, indicators provided by the agricultural census relate specifically to agricultural holdings, not to all households or even all rural households. WCA 2010 provides the option to widen the scope of the agricultural census to cover all rural households (see Chapter 8), which might provide more useful MDG measures. The need for such MDG data might be an important factor in a country deciding to widen the scope of the agricultural census. Despite the limited coverage of the agricultural census, it can still provide valuable supplementary MDG measures, as well as a better understanding of the factors influencing the MDG indicators, especially agricultural production issues such as farm size and cropping systems.

2.11. Agricultural censuses are normally undertaken every ten years and this provides a good basis for monitoring the MDGs over time. Many countries will carry out at least two agricultural censuses during the 1990–2015 MDG reference period. Often, the agricultural censuses are conducted in the early years of each decade, which can be especially suitable for MDG monitoring.

2.12. An agricultural census could provide a range of data of interest to the MDGs:

- Goal 1: Eradicate extreme poverty and hunger. This goal calls for halving the proportion of people who suffer from hunger. Two MDG indicators are used: the prevalence of underweight children under five years of age (Indicator 4); and the proportion of population below the minimum level of dietary energy consumption (Indicator 5). Data from a supplementary household food security module would help to better understand changes in the structure of agriculture and their effect on household food security. For example, the prevalence of

underweight children could be analysed in relation to such things as farm size, cropping systems, agricultural practices and land tenure to better understand why people are food insecure.

- Goal 2: Achieve universal primary education. Some data relating to enrolment ratios in primary education (MDG Indicator 6) are often available from the agricultural census. This enables enrolment data for different groups of households to be analysed, and the factors contributing to low school enrolment, such as farm labour requirements and distance from school, to be studied.
- Goal 3: Promote gender equality and empower women. MDG Indicators 9–11 relate to gender disparity in education and non-agricultural employment. The agricultural census does not directly provide these measures, but it provides a range of data related to the role of women in agricultural production activities and the participation of rural women in non-farm economic activities. For more information, see paragraphs 2.27–2.31.
- Goal 7: Ensure environmental sustainability. This calls for “integrating the principles of sustainable development into country policies and programmes and reversing the loss of environmental resources”. An agricultural census collects a range of environment data related to irrigation, soil degradation, use of mineral fertilizers, and use of pesticides. An agricultural census may also be useful for two specific MDG indicators.
 - Indicator 25 refers to the proportion of land area covered by forest. The agricultural census provides data on the forest land operated by agricultural holdings. If a community survey is undertaken as part of the agricultural census, it could also provide detail on community forest land.
 - Indicator 32 refers to land tenure in urban areas. The agricultural census provides land tenure data for agricultural holdings. This is of interest in understanding the effect of security of land tenure on agricultural practices and household food security.
- Goal 8: Develop a global partnership for development. MDG Indicator 45 refers to the unemployment rate for persons aged 15 to 24. These data are available from the agricultural census for household members of agricultural holdings. If the scope of the agricultural census was widened to cover all rural households, more meaningful MDG-related data relating to the rural sector could be provided.

2.13. The community-level data collected as part of the agricultural census could also provide data to help in monitoring the MDGs, especially for Goal 7: Ensure environmental sustainability. The community survey could provide data relating to several MDG indicators for this goal:

- Indicator 25: proportion of land area covered by forest.
- Indicator 30: proportion of population with access to safe drinking water.
- Indicator 31: proportion of population with access to improved sanitation.

2.14. WCA 2010 has been formulated with the MDG indicators in mind. Particular attention has been given to ensuring that concepts and definitions for the agricultural census are consistent with international standards and with the requirements for monitoring the MDGs. For example, the definition of forestry used in the agricultural census to measure forestry activities on agricultural holdings should be consistent with the MDG forestry concept, so that the census data can be meaningfully related to the relevant MDG indicator.

Poverty monitoring and analysis

2.15. Achieving sustainable economic growth with the focus on combating poverty has become the key development goal for governments around the world, as reflected in the MDGs and, in particular, Goal 1. Most of the poor live in rural areas, often in isolated conditions, where they face problems of poor natural resources, underdeveloped infrastructure, lack of access to markets, fluctuating commodity prices, lack of employment opportunities, and vulnerability to natural disasters. The agricultural census helps to better understand the causes of poverty and provide baseline data for monitoring poverty alleviation programmes.

2.16. Rural poverty is strongly related to the structure and efficiency of the agricultural production industry. Shortage of land is often one of the main causes of poverty, and agricultural census data on farm size and the types of cropping systems can help to understand whether farm households have sufficient land to support their needs. Employment data for household members highlights the extent to which households need to supplement their farm incomes through work off the holding.

2.17. Many poor farmers seek to be self-sufficient in food, carrying out traditional forms of low productivity production. The agricultural census crop data can underline the potential for raising farm incomes through crop diversification and the adoption of high value crops. Farmers are often unable to raise their living standards because they cannot access services that might enhance their productivity, such as credit, extension and veterinary services. The agricultural census data can help to highlight problems in these areas. Data on the degree of farm mechanization and the types of inputs used can help to identify other factors constraining farmers from increasing their agricultural productivity.

2.18. The community-level data collection, introduced for the first time in the 2010 programme, can provide a useful source of data on infrastructure issues affecting farmers' incomes, especially relating to the access farmers have to agricultural produce markets. Community data on the economic activities in the commune can also help to understand whether farmers and their families have alternative employment opportunities.

2.19. Some countries have a system in place to identify which communities are poor, and this can provide the basis for an economic status measure in the community survey. This can be valuable in analysing the agricultural characteristics of holdings in relation to whether they live in a "rich" or "poor" community. The agricultural census could highlight whether communities are poor because, for example, farm sizes are too small, because farmers do not have access to irrigation, or because there is not sufficient crop diversification. The relationship between poverty and aspects such as land tenure, access to credit, and the use of extension services can also be of interest.

2.20. Usually, income and poverty data at the household level are not directly collected in an agricultural census. However, under the modular approach for WCA 2010, a country could include such data in a small census supplementary module, if required. Another approach is to develop proxy income/poverty measures from other data collected in the agricultural census, such as farm size, land tenure, and ownership of farm machinery. Additional simple proxy measures could be included in the agricultural census to help in poverty analysis work. Data on ownership of specific assets can be particularly helpful in this regard.

Food security monitoring and analysis

2.21. The goal set by the World Food Summit in 1996 to halve the number of undernourished in the world between 1996 and 2015 has become a key focus of governments around the world. The importance of combating hunger while achieving economic growth is one of the cornerstones of the MDGs, as reflected in Goal 1. A wide range of data is needed to monitor progress towards this goal, and the agricultural census can play a role in this regard.

2.22. On the food availability side, data from the agricultural census helps in understanding the structure of the food production industry and the constraints faced by farmers in increasing agricultural production, as well as suggesting strategies for increasing agricultural productivity. Cropping patterns can be studied along with information on the use of irrigation, farm machinery and improved varieties of seed to help develop programmes for increasing food production.

2.23. The agricultural census also addresses food access issues. A new element in WCA 2010, the collection of community-level data, can be especially useful in this area. For example, data on the presence of agricultural produce markets and other infrastructure in the community can help to assess the effectiveness of the food distribution system.

2.24. Issues related to stability of food supplies, such as weather conditions and exposure to natural disasters, can also be studied from the community component of the agricultural census.

2.25. The agricultural census also provides broad economic, social and environmental indicators to show the background against which the food economy operates. The agricultural census can help in studies of environmental issues that may affect agricultural output, such as forest cover, and the use of fertilizers and pesticides. Household data from the agricultural census may also highlight social issues affecting food security, such as changes in demographic patterns and household structures.

2.26. The inclusion of a census supplementary module on food security is an important initiative in WCA 2010. This could provide direct measures of household food security, such as whether the household faced food shortages, when the food shortages occurred, reasons for the food shortages, and the effects on household eating patterns. Anthropometric data for children would enable the effects of food insecurity on nutritional status to be directly measured. This would also be invaluable for examining the nutritional status of children in relation to other data collected in the agricultural census, such as purpose of production, land tenure and type of crops grown. This would help answer questions such as whether subsistence farmers, or farmers not owning their own land, are more prone to be food insecure.

Measuring the role of women in agriculture

2.27. Goal 3 of the MDGs acknowledges the promotion of gender equality and empowerment of women as key elements in advancing social and economic progress. Women are often disadvantaged because of discriminatory social norms and legal institutions, and this may be reflected in disparities in literacy, educational opportunities, participation in the labour market, and the allocation of work on the family farm. The agricultural census has an important role to play in providing gender data related to agriculture to help monitor progress towards achieving gender equality goals. Efforts have been made to bring a greater gender perspective to WCA 2010 to help in addressing these issues.

2.28. The contribution of women to agricultural development is often not well-understood because of the lack of data and the problems in accurately measuring women's involvement in agricultural production activities. The agricultural census can be an important vehicle for studying the social and cultural patterns of agricultural and rural development as they relate to women, the distribution of agricultural work within households, and the interactions between different household members in the management and operation of agricultural holdings. For more on gender issues in agricultural censuses, refer to *Agricultural Censuses and Gender Considerations: Concepts and Methodology* (FAO, 1999).

2.29. The identification of the agricultural holder provides the basis for comparing the characteristics of holdings operated by men and women. Analysing aspects such as area of holding, cropping patterns, and use of different agricultural practices can help to focus on the problems faced by women in operating agricultural holdings. In WCA 2010, the concept of agricultural holder has been modified to recognize that the agricultural holder could be a group of persons – for example, a husband and wife. This should better reflect the realities of farm management practices, especially related to the role of women. The agricultural holder concept is often difficult to apply because of a gender bias in the reporting of data; in WCA 2010, countries are strongly urged to address this issue in the design of questionnaires, development of field procedures, training of field staff, and management of the data collection operation.

2.30. Data on the economic activity of each household member can be used to study the division of labour within households and the responsibilities of women for work on and off the holding. Data such as the employment characteristics of women, and the time worked during a twelve-month reference period in her main job, on the holding, and in all other jobs, can be of particular interest. The problems in collecting accurate employment-related data, especially for women in rural areas, have been acknowledged in WCA 2010, and improved guidelines for the collection of these data have been provided.

2.31. Data on sub-holdings and sub-holders, introduced for the first time in WCA 2010, enables the specific crop and livestock activities undertaken under the operational/management responsibility of women to be analysed. For example, if women tend to be responsible for managing livestock, the census would provide information on the number of women performing this role, their demographic characteristics, main occupation, the time they spend in work on and off the holding, and the type of livestock they manage. The division of managerial responsibility in the household can also be studied – for example, how many sub-holders there are and who are they – and the role of women in decision-making can be assessed.

Agricultural planning and policy-making¹

2.32. As highlighted in paragraph 2.4, an agricultural census provides the opportunity to analyse the characteristics of agricultural holdings and their agricultural production activities, as an aid to helping the government and others in effective planning and policy-making.

2.33. The use of the agricultural census for policy-making and planning in relation to poverty and gender issues has already been noted in previous sections. Other examples of planning and policy issues that can be analysed using the agricultural census are:

- Study of a specific crop. Census tables specific to agricultural holdings with the particular crop – for example, coffee – can be used to measure the number and location of coffee growers, the distribution of coffee growers by plantation area, cropping systems used by coffee growers, labour requirements for coffee growing, etc.
- Study of a specific livestock production system. Census tables specific to agricultural holdings with the particular livestock type – for example, sheep – can be used to measure the number and location of sheep producers, the distribution of sheep producers by flock size, the integration of sheep raising with cropping activities, etc.
- Structure of agriculture in a particular area. Census tables relating to the particular geographic area, such as a district, can highlight the main crops grown and livestock raised in the district, the agricultural practices used in the district in comparison with other districts, employment characteristics in the district, etc.
- Inter-relationship between crop and livestock production. Census tables can be prepared showing the number of holdings with specific combinations of crop and livestock types.
- Sources of farm labour. Census tables can be prepared to show the types of farm labour inputs for specific farming systems and the role of household and outside labour.
- Farm typology studies. The agricultural census can be useful for classifying holdings by type, as an aid to developing agricultural development policies. For example, holdings can be sub-divided into whether they are subsistence or market oriented, and different policies and programmes can be developed for each group.
- Studies of small holdings. See Box 2.1.

2.34. Agricultural census data are suitable for in-depth agricultural research in support of planning and policy-making, involving the use of specialized statistical methods such as correlation and regression analysis. Using these techniques, it is possible to quantify the relationships between different characteristics, to better understand the reasons why farmers make certain decisions, and their likely response to particular policy actions. Agricultural censuses often provide the only way to do this type of analysis due to the availability of individual holding data. For example, regression techniques could be used to study the relationship between good agricultural practices and characteristics such as household size, holder's age, holder's education, and access to extension services, to understand the main factors affecting agricultural practices. The analysis might show that, for example, good agricultural practices are not strongly related to whether the holding used extension services, suggesting the need for strengthening the extension services.

Improving current agricultural statistics

2.35. A decennial agricultural census cannot be used as a source of current agricultural statistics because it does not provide data frequently enough. However, the agricultural census can provide reliable current data relating to crop and livestock production for the census year, and this can be useful as a benchmark for improving current crop and livestock statistics. The inclusion of crop production data in the programme for the first time is a considerable help in this regard.

¹ The remaining sections of this chapter have drawn heavily on material presented in *Looking into Agricultural Statistics: Experiences from Asia and Pacific* (Colwell, 1977).

Box 2.1: Use of the agricultural census to study small holdings – an example

In many countries, farm sizes have been declining in the face of high population growth and shortages of land, raising questions about the viability and efficiency of small holdings and the need for government programmes to assist small farmers. Data from an agricultural census can be used to study small holdings. This can be done by preparing census tabulations classified by area of holding to enable the characteristics of small holdings to be analysed in relation to other holdings.

Some issues that could be examined using agricultural census data are shown below.

Study of small holdings: issues highlighted by the agricultural census

Issue	Agricultural census data
1. How have farm sizes changed over time?	Number of holdings, area of holdings, average size of holding, number of parcels – for present and past agricultural censuses.
2. How many small farms are there and where are they?	Number of holdings classified by area of holding (e.g., less than 0.50 ha, 0.50-0.99 ha, etc.) and geographic area (e.g., district).
3. How equitable is the land distribution?	Percentage of holdings in each area of holding group and percentage of farm area in those groups.
4. Are small farms cultivated more intensively than large farms?	Average cultivation intensity for each area of holding group, number of holdings classified by area of holding and cultivation intensity (e.g., under 1.00, 1.00-1.49, etc.).
5. Are agricultural practices on large farms better than on small farms?	Number of holdings classified by area of holding and use of specific farm practices, such as farm machinery, improved seeds, fertilizers, pesticides, etc.
6. How many households do not have sufficient land to support themselves?	Number of holdings classified by area of holding and household size.
7. To what extent do households on small farms rely on outside work to supplement farm income?	Number of holdings classified by area of holding and economic activity of household members on and off the holding.
8. What role does livestock play in supplementing the farm income on small farms?	Number of holdings classified by area of holding and whether the holding has each type of livestock.

Source: Colwell, 1997.

The above analysis would help to highlight the problems faced by small holdings and suggest ways in which those problems could be overcome. For example, the census tabulations might show that small holdings use less fertilizer than large holdings, especially in certain provinces. This might suggest the need for some support to be provided in those provinces to help improve the productivity of small holdings.

The census can also be used to cost different policy options. For example, if the government is considering providing fertilizer to each small holding in certain provinces, this proposal could be costed using data from the agricultural census, by estimating how many small holdings would be entitled to this benefit.

2.36. For crops, the agricultural census usually provides the most reliable data available on the area and production of each crop at each administrative level for the census reference year. This is especially the case for minor crops, where the current statistics are often weak. The census data could provide a base for estimating crop area and production in the following years. For example, the current crop area could be obtained by estimating the change in the crop area since the census reference year.

2.37. Current statistics on permanent crops are often weak because of data collection difficulties, especially for trees not grown in plantations. Census data on production can provide benchmark production figures. Data on the number of productive and non-productive trees can be used to project future production trends.

2.38. Current livestock production statistics are often weak because of the lack of data on herd structures. The agricultural census can help in this regard. Census data on livestock numbers by age, sex and purpose, together with data on the population dynamics of livestock herds such as take-off and reproductive rates, can provide a base for projecting livestock numbers in future years for use in estimating milk and meat production.

2.39. Often, countries find it difficult to reconcile crop or livestock data from the agricultural census with the current agricultural statistics obtained from sample surveys or administrative collections. Sometimes, there are good statistical reasons for differences in the statistics. The geographic area covered by either collection may be incomplete, such as urban areas being excluded. Certain types of holdings, such as small holdings, may be omitted from one or the other collection. Concepts and definitions may be different; for example, in the treatment of mixed cropping. There could be inconsistencies in the reference periods or in the definition of crop seasons. Sub-national data may be inconsistent because the agricultural census collects data on the basis of where the holder lives, not where the land or livestock are located. If sampling is involved, the sample results will not be exact because of sampling errors. Countries should seek to quantify these and any other statistical factors to explain the reasons for discrepancies in the data.

2.40. In the end, discrepancies between data from the agricultural census and the current statistics may come down to differences in the data collection methodology and the quality of data associated with each data source. This especially applies where the current agricultural statistics are based on administrative reports. Often, an agricultural census provides the only source of statistically sound data, and countries should take advantage of the opportunity provided by the census to improve the current agricultural statistics.

Providing baseline data for monitoring agricultural development projects

2.41. Typically, an agricultural development project aims to achieve certain outcomes in a defined project area. Baseline data are needed to help assess whether the project has been successful. An agricultural census provides detailed structural data for small geographic areas, making it an ideal source of baseline data.

2.42. Agricultural censuses can be tabulated for any defined geographic area or for any particular group of holdings, which means that it can provide data for any required target group for a project. For example, if a project is designed to improve coffee growing in a particular project area, census tables can be prepared showing data for coffee growers in that specific area.

Providing data for the private sector

2.43. As well as providing data for government planning and policy-making, an agricultural census is also a valuable source of data for the private sector. The main interest for the private sector is usually in data to help make commercial decisions. A food processing company could use agricultural census data on the number of growers and area for specific crops in each district to help identify suitable sites for its processing plants. An input supplier could use census data on input use for each crop by district to better understand market opportunities. Farm machinery suppliers could make use of data on the area of each type of crop grown and the number of growers to assess the potential demand for their products. A company planning to establish a business in a particular location could use census data to assess the availability of labour and the pool of skills available in that location.

CHAPTER 3

METHODOLOGICAL CONSIDERATIONS

This chapter discusses some important methodological issues to be considered in the development of a census of agriculture. The timing and objectives are reviewed, and the scope of the census is discussed. The concepts of agricultural holding and agricultural holder are reviewed and two new items, the sub-holding and the sub-holder, introduced. Options for the frame for the census of agriculture and the use of complete or sample enumeration are discussed. The steps involved in developing and undertaking an agricultural census are also summarized.

Timing of the census of agriculture

3.1. WCA 2010 covers the ten-year period 2006–2015. Countries are encouraged to carry out their agricultural census as close as possible to the year 2010, to help to make international comparisons more meaningful, while recognising that the timing of a country's census is determined by many factors, including administrative and financial considerations .

3.2. In particular, Countries should take into consideration the timing implications imposed by the population census, especially where the two censuses are to be coordinated. In the population census programme, it is recommended that countries undertake their censuses in years ending in "0" or as near to those years as possible. Many countries adhere to that recommendation. There are many advantages in running the agricultural census at the same time as, or soon after, the population census, especially as agriculture related data and field materials will still be current.

Objectives of the census of agriculture

3.3. In the past, the census of agriculture has aimed to provide data on the structure of agricultural holdings, with attention given to providing data for small administrative units and other detailed cross-tabulations of structural characteristics. Agricultural censuses have also been used to provide benchmarks to improve current crop and livestock statistics and to provide sampling frames for agricultural sample surveys. Previous agricultural censuses have focused on the activities of agricultural production units; that is, households or other units operating land or keeping livestock. They have not been seen as censuses of rural households.

3.4. Since agricultural censuses are undertaken only every ten years, it is natural to associate them with those aspects of agriculture that that change relatively slowly over time. Thus, agricultural censuses are mainly concerned with data on the basic organizational structure of agricultural holdings, such as farm size, land use, crop areas, livestock numbers and use of machinery. Agricultural censuses have not normally included data that change from year to year, such as agricultural production or agricultural prices.

3.5. The basic objectives of the census of agriculture have remained relevant over the past few agricultural census rounds. One development since the 2000 agricultural census programme has been the MDG framework for sustainable economic development (see paragraphs 2.5–2.6). Countries are giving increasing emphasis to monitoring progress towards the MDGs, and the agricultural census is seen as an important source of data for this purpose. There has also been more focus on poverty alleviation. An additional objective has been included to reflect this emphasis. For WCA 2010, the objectives of the agricultural census are:

- (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.

Scope and coverage of the census of agriculture¹

3.6. Broadly speaking, an agricultural census aims to measure the structure of the agricultural production industry. The scope of the agricultural production industry could be interpreted very broadly to cover not only crop and livestock production activities, but also forestry and fisheries production activities, as well as other food and agriculture related activities. Past agricultural census programmes have taken a narrow view of agriculture by focusing only on those units engaged in the production of crop and livestock products. Units engaged in forestry or fisheries were not covered unless they also had some crop or livestock production activities.

3.7. For the 2010 round of agricultural censuses, it is recommended that the scope of the agricultural census remains the same as in previous programmes. However, it is recognized that aquaculture is becoming increasingly important in many parts of the world, and countries are encouraged to conduct an aquacultural census in conjunction with the agricultural census, where there is a need for aquacultural data. Further information on the aquacultural census is given in Chapter 7.

3.8. International statistical standards for defining areas of economic activity are given in the International Standard Industrial Classification of all Economic Activities (ISIC) (UN, 2004b). For more information on ISIC, see Appendix 1. The scope of an agricultural census may be defined under ISIC (Rev. 3.1) as follows:

- Group 011: Growing of crops; market gardening; horticulture.
- Group 012: Farming of animals.
- Group 013: Growing of crops combined with farming of animals (mixed farming).

3.9. Ideally, an agricultural census should cover all agricultural activity in a country according to the above ISIC groupings. In the past, many countries have applied a minimum size limit for inclusion of units in the census or excluded certain areas such as urban centres. This is justified on the grounds that there are usually a large number of very small holdings making little contribution to total agricultural production and it is not cost-effective to include them in the agricultural census. However in many countries, small-scale agriculture makes a significant contribution to household food supplies and is often an important source of supplementary household income. In some countries, almost all households have some own-account agricultural production activities, such as keeping a few chickens or having a small kitchen garden. The inclusion of small holdings is also important to reflect women's participation in agricultural work.

3.10. Various criteria may be used to establish minimum size limits, such as: area of holding, area of arable land, area of temporary crops, number of livestock, number of livestock over a certain age, quantity of output produced, value of agricultural production, quantity of labour used, and quantity of produce sold. Sometimes, the scope of the agricultural census is restricted to commercial agricultural activities, omitting households with a small area of crops used solely for home consumption. Minimum size limits are often difficult to apply. For livestock numbers, one needs to have complex criteria involving numbers of each type of livestock. For example, one may wish to omit households with less than 20 chickens or with less than

¹ In WCA 2010, the word "scope" refers to the target group of units for the agricultural census. "Coverage" refers to the extent to which certain units, such as small holdings, are omitted. In previous programmes, the word "scope" referred to the data items included in the census.

three pigs, but what if a household has 18 chickens and two pigs? Setting a minimum value of agricultural production is difficult to apply, especially where a large part of the agricultural output is for the household's own consumption.

3.11. An alternative to minimum size limits is to cover all units regardless of size, but ask only some very limited questions for small units. This is easy to do where, as is often the case, the frame for an agricultural census is a list of households and some initial questions are needed to screen out those who are not agricultural holdings. Here, the following approach could be used:

- First, ask questions about crops and livestock needed to identify all agricultural production units, regardless of size. Collect some basic information for those units.
- Second, ask some additional questions to identify those agricultural production units above the minimum size limit. Proceed to ask the more detailed questions for those units.

3.12. Sometimes, countries omit certain areas of the country or certain types of agricultural activity – such as remote areas or areas with security problems – for operational reasons. Countries should decide on any out-of-scope areas according to local conditions, making sure that the usefulness of the census is not jeopardized. For example, omitting remote desert regions may result in missing important livestock resources, such as in nomadic areas. Sometimes, it might be appropriate to cover only the household sector, if it is dominant in agriculture. Often, agricultural activities of the military are excluded; sometimes, schools and religious organizations are also omitted.

3.13. Usually, it is not possible to cover all agricultural activity in an agricultural census for one reason or another. In planning the agricultural census, countries should be realistic about what can be done within available budgets and staff resources, and ensure that what is done is done well.

3.14. It should be recognized that, in an integrated agricultural statistics system, any exclusions from the agricultural census affects not only the results of the agricultural census, but also the surveys that are conducted based on the agricultural census. Thus, an agricultural production survey based on an agricultural census frame will not cover the census out-of-scope units, and agricultural production estimates from the survey will be affected accordingly.

3.15. Countries should clearly specify the scope in the presentation of agricultural census results. Where certain geographic areas or types of agricultural activity are excluded, this should be highlighted in the census reports to help users interpret and analyse the results.

Content of the census of agriculture

3.16. The modular approach for the census of agriculture envisages a core census module based on complete enumeration to collect key data, and a series of sample-based supplementary modules to collect more in-depth data. A list of recommended core items is shown in Chapter 4, along with a list of optional items for inclusion in the supplementary modules, as required. Items have been selected as being suitable for the core module on the basis of the following criteria:

- The items are the key items needed for agricultural policy-making and planning.
- Data for the items are required to be produced for small administrative units such as districts or villages, or in the form of detailed cross-tabulations. Such data could not be provided from an agricultural sample survey because of high sampling errors.
- The data involve the measurement of rare events, such as unusual crops or livestock, which would not be possible to estimate from a sample survey because of high sampling errors.
- The data are required to establish sampling frames.
- The data are required to make international comparisons.

3.17. In developing its census of agriculture, a country should include in the core census module all the recommended census core items, plus additional items from the list of supplementary items according to national requirements.

3.18. One reason a country might include additional items in the core module is because detailed geographic data are needed. For example, if livestock numbers by age and sex are needed at the district or village level, these items may need to be included in the core module, rather than a supplementary module. Countries should carefully consider the suitability of each item for the core census module and the costs involved. For example, education data are of interest in an agricultural census to broadly analyse the relationship between education and farm characteristics, not to measure education levels as in a population census, and this item is therefore better suited to a supplementary module.

3.19. Another possible reason to include additional items in the core census module is to provide data to help create sampling frames for the census supplementary modules and for the programme of agricultural surveys. Where possible, countries should plan their agricultural survey programme prior to the agricultural census to ensure that the census can be designed to meet the sampling frame needs. For example, if an in-depth fertilizer survey was to be conducted, a fertilizer usage item could be included in the core census module for sampling frame purposes.

3.20. Countries should carry out one or more census supplementary modules according to the national requirements, based on the list of items provided. Additional items may be added as required. Several modules may be combined into a single survey.

3.21. Some further issues for consideration in deciding on the content of the agricultural census are:

- The data needs of agricultural policy-makers and planners. The agricultural census should be developed specifically to meet the needs of agricultural policy-makers and planners. Data requirements will be different in each country, depending on the policy issues and priorities.
- The suitability of the census vehicle for the collection of the data required. An agricultural census is intended to collect structural data and the items included should focus primarily on those types of data. Operational data are usually not suited to an agricultural census. Items requiring in-depth questions, such as cost of production, are also best collected in other agricultural surveys.
- The technical, operational and financial resources available to undertake the census. Conducting censuses is not only costly but also requires considerable human resources for the development, data collection and data processing. Countries need to balance the need for data against the resources available. The ability to produce timely data is an important issue.
- The willingness and ability of the public to supply the information required. Care is needed in the selection of items and the design of questionnaires to ensure that reliable data can be collected from respondents. Some items may be sensitive because of cultural or economic reasons – for example, respondents are sometimes reluctant to supply land data because they fear it may have taxation consequences.
- The data collected in previous rounds of the agricultural census. Collecting the same data as in past censuses can be valuable in tracking changes in the structure of agriculture over time. However, items should not be automatically carried over from one census to the next without reviewing their continuing relevance to current data needs and the suitability of the concepts and definitions used.
- The need for data for international comparisons. The 16 recommended core items will provide the basis for FAO to make a global assessment of agricultural holdings. FAO recommends that all countries collect these items so that international comparisons can be made.

Statistical unit

3.22. The statistical unit for a data collection is the basic unit for which data are collected. In previous agricultural census programmes, the statistical unit used has been the agricultural holding and this is used again in WCA 2010.

3.23. The definition of an agricultural holding remains the same as in previous programmes; that is:

“An agricultural holding is an economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form, or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households, by a clan or tribe, or by a juridical person such as a corporation, cooperative or government agency. The holding's land may consist of one or more parcels, located in one or more separate areas or in one or more territorial or administrative divisions, providing the parcels share the same production means, such as labour, farm buildings, machinery or draught animals.”

3.24. For information on the relationship between an agricultural holding and the national accounting framework, refer to Appendix 1.

3.25. There are two types of agricultural holdings: (i) holdings in the household sector – that is, those operated by household members; and (ii) holdings in the non-household sector, such as corporations and government institutions. In most countries, the majority of agricultural production is in the household sector. The concept of “agricultural holding” is therefore closely related to the concept of “household”.

3.26. The household is one of the basic elements of a national statistics system and standards for defining a household have been laid down by the United Nations in its guidelines for population and housing censuses as follows:

“The concept of household is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either (a) a one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household, or (b) a multi-person household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their incomes and may, to a greater or lesser extent, have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated” (UN, 1998, paragraph 1.324).

3.27. A household may occupy the whole of a dwelling, part of a dwelling, or more than one dwelling. There may be more than one household living in a dwelling. Some households consist of extended families making common provision for food and may occupy more than one dwelling. In other cases, different family units live in separate dwellings, but have a common head, such as in polygamous unions. Some households live in camps, boarding houses or hotels, or as administrative personnel in institutions. They may also be homeless. Often, the concept of a “family” is more readily understood than a “household”, but it is not the same thing; a family may include people living in other households in other places.

3.28. For the household sector, there is usually a one-to-one correspondence between an agricultural holding and a household with own-account agricultural production activities; in other words, all the own-account agricultural production activities by members of a given household are usually undertaken under single management. Managing agricultural production activities usually goes hand-in-hand with making common arrangements for food and other essentials, pooling incomes, and having a common budget. It is unusual for different household members to operate agricultural land or livestock completely independently, but pool incomes. It is also unusual for household members to operate land or livestock as a single unit, but to have independent household budgets. Even if there is a degree of independence in the agricultural activities of individual household members, the income or produce generated by different household members is usually pooled. Often, different members of the same household own land, but usually the agricultural operations in the household are carried out as a single unit.

3.29. There are two special cases where the agricultural holding and household concepts may diverge:

- If there are two or more units making up a household, such as where a married couple lives in the same dwelling as their parents, the two units may operate land independently but, as members of the same household, they make common arrangements for food and pool incomes.

- In addition to an individual household's agricultural production activities, a household may operate land or keep livestock jointly with another household or group of households. Here, there are two agricultural holding units associated with the household: (i) the agricultural production activities of the individual household itself; and (ii) the joint agricultural operations with the other household(s).

3.30. In the past, some countries have found it difficult to strictly apply the agricultural holding concept in the agricultural census and, instead, have defined the agricultural holding to be equivalent to a household with own-account agricultural production. Usually, there is little difference between an agricultural holding and a household with own-account agricultural production. Equating the agricultural holding and household units has several benefits:

- The identification of the holding in the agricultural census would be simplified; it would no longer be necessary to find out about the management of the household's own-account agricultural production activities.
- It would bring the concept of agricultural holding into line with the practice already used in previous agricultural censuses in many countries.
- The use of a common statistical unit – the household – would enable the agricultural census to be more easily linked to the population census.
- It would facilitate the analysis of household characteristics.
- If the scope of the agricultural census was expanded to also include other households not engaged in own-account agricultural production, there would be a common unit between agricultural production units and other households.

3.31. Countries should consider the advantages of defining the agricultural holding unit in this way, taking account of operational considerations and the issues mentioned above. The definition of the holding should be clearly stated in the presentation of census results to help in the interpretation of data.

3.32. Care is needed in defining the statistical unit for the non-household sector. Corporations and government institutions may have complex structures, in which different activities are undertaken by different parts of the organization. The national accounting concept of establishment should be used (see Appendix 1), where an establishment is an economic unit engaged in one main productive activity operating in a single location.

3.33. One problem with the definition of an agricultural holding is that a single holding may have land parcels in more than one village, district or province. This sometimes creates anomalies in the census results. The holding definition refers to the different parcels making up the holding "sharing the same production means, such as labour, farm buildings, machinery or draught animals". Thus, parcels of land a few hundred kilometres apart should not be considered part of the same holding because they cannot share the same inputs. Countries should review the application of the definition to their local conditions. Some countries may wish to define a holding as being within a single administrative unit such as a district or province.

3.34. The following additional points relate to the identification of an agricultural holding:

- Agricultural holdings may have no significant land area; for example, poultry hatcheries or holdings keeping livestock for which land is not an indispensable input for production.
- Agricultural holdings may be operated by persons who do not have any rights to agricultural use of the land except for the products of the trees grown on it (tree holdings).
- If a member of a cooperative, religious organization, government agency, clan or tribe is assigned a separate unit for agricultural production that is operated under the member's management, and over which the member has general, technical and economic responsibility, then this unit represents a holding.

- Open rangeland (such as land open to communal grazing) is not normally considered a holding. A specified area delimited by fencing, or any other form of boundary demarcation may be an exception.

3.35. Normally, an agricultural holding is defined according to whether the unit is an agricultural production unit at the time of the agricultural census. However, there are some special cases for holdings in the household sector.

- If a household sold all its land and livestock during the census reference year, it is no longer an agricultural production unit and therefore does not represent an agricultural holding. The household that is operating the land and livestock at the time of the census represents the agricultural holding and, moreover, should report all crop and livestock activities during the reference year, including activities carried out prior to the sale. This can be difficult to apply.
- If a household leases land to grow crops in a particular season, but the census is undertaken in a different season, the household should be considered as an agricultural holding, even though it is not engaged in agricultural production activities at the time of the census. Here, the household should report crop activities during the reference year in the normal way.
- Sometimes, a household owning a piece of land may operate the land itself during the summer season, but rent it out to another household to cultivate during the winter season. Here, the piece of land should be reported as part of the area of holding for both households. This results in some double counting of land.

Agricultural holder

3.36. The agricultural holder is defined as the civil or juridical person who makes the major decisions regarding resource use and exercises management control over the agricultural holding operation. The agricultural holder has technical and economic responsibility for the holding and may undertake all responsibilities directly, or delegate responsibilities related to day-to-day work management to a hired manager.

3.37. By definition, the agricultural holding is under single management, and therefore there cannot be more than one agricultural holder for an agricultural holding. However, there may be more than one joint holder in a holding. A joint holder is a person making the major decisions regarding resource use and exercising management control over the agricultural holding operations, in conjunction with another person. A joint holder can be from within the same household or from a different household.

3.38. The concept of an agricultural holder is often difficult to apply because of the complex decision-making processes on the holding. Often, a holding is managed jointly by members of the household, such as a husband and wife. If there is one person making the major decisions, he/she should be defined as the holder. If more than one person is involved in major decision-making, each of those persons should be considered as a joint holder. If there are two quite distinct agricultural management units in a household, the household should be split into two agricultural holdings (see also sub-holding and sub-holder concepts 3.42–3.52 below)

3.39. The concept of agricultural holder is normally only applied to agricultural holdings in single-holding households. Agricultural holders can be identified for other types of holdings, but the data are not useful for census analysis. The agricultural holder is often, but not always, the household head. The agricultural holder may do other work in addition to being a holder; being a “farmer” may not even be his/her main occupation. A distinction should be made between an agricultural holder and a hired manager; a hired manager is a paid employee who manages an agricultural holding on behalf of the agricultural holder.

3.40. Some countries may wish to provide more detailed information on the management of the holding. The sub-holding and sub-holder concepts have been introduced in WCA 2010 to reflect this need. For more information, see paragraphs 3.42–3.52.

3.41. Countries need to carefully consider how best to collect agricultural holder information in the

agricultural census. Care is needed to differentiate between the household head and the agricultural holder; often, cultural factors influence who is determined to be the household head – sometimes, it is the oldest male – and that person may not be actively involved in the household’s agricultural operations. Often, a single question on who is the main decision-maker for the holding is insufficient, and it may be necessary to ask a series of questions about each household member, their work on the holding, and their role in managing the holding. Special attention needs to be given to ensuring that the role of women is adequately acknowledged in identifying the agricultural holder. As with all data collection, questionnaires must be carefully designed and tested, and enumerators well trained and closely supervised.

Sub-holding and sub-holder

3.42. The concept of an agricultural holder as the major decision-maker for the holding may not provide a realistic picture of the often complex decision-making processes of the holding. Often, different members of the household take responsibility for managing particular aspects of the operations of the holding. Sometimes, women carry out specific activities such as cultivating particular land plots or managing particular livestock activities. There may also be different levels of management; for example, one person may make the strategic decisions (“this year we plant potatoes”), while other people are responsible for operational decisions such as when to plant, who to employ, and how to market.

3.43. Some countries may feel that the concept of agricultural holder alone does not adequately reflect the management of the holding, and, in particular, fails to recognize the role of women in managing agricultural activities. To overcome this problem, the concepts of “sub-holding” and the associated “sub-holder” have been introduced in WCA 2010.

3.44. A sub-holding is defined as a single agricultural activity or group of activities managed by a particular person or group of persons in the holder’s household on behalf of the agricultural holder. There may be one or more than one sub-holding in a holding. A sub-holding could comprise a single plot, a whole field, a whole parcel, or even the whole holding. A sub-holding could also be a livestock operation associated with a plot, field or parcel, or a livestock operation without any land.

3.45. A sub-holder is a person responsible for managing a sub-holding on the holder’s behalf. There is only one sub-holder in a sub-holding, but there may be more than one sub-holder in a holding. The holder may or may not be a sub-holder. The sub-holder concept is broadly similar to the concepts of “plot manager” and “farm operator” used in some countries.

3.46. A typical situation is where the holder is designated as a male and takes prime responsibility, as a sub-holder, for growing the primary crops. The holder’s wife may be a second sub-holder, with specific responsibility for managing, for example, the kitchen garden. Other household members could also be sub-holders with specific responsibilities on the holding, such as livestock.

3.47. The same piece of land could be part of two sub-holdings – for example, if one person grows rice on the land in the summer and another grows vegetables on the land in the winter. The association of livestock with land needs to be carefully considered. A person responsible for cattle on the holding’s grazing land is the manager of that grazing land, whereas someone managing livestock in communal land would not be specifically managing a piece of land associated with the livestock.

3.48. In an agricultural census, interest often centres on identifying the specific crops grown or livestock raised by sub-holders, and these items are included in the agricultural census as supplementary Items 1213 and 1214. For these data to be meaningful, the sub-holding must consist of activities related to specific crops grown or specific livestock raised by the sub-holder. The sub-holding concept makes no provision for one person being responsible for crop planting and another for crop harvesting.

3.49. The use of the sub-holding/sub-holder concepts could provide a better way of identifying the agricultural holder. Rather than identifying the holder directly, each sub-holder could first be identified and this information used to determine the primary decision-maker on the holding.

3.50. The sub-holding/sub-holder concepts are complex, involving notions of management,

decision-making and delegation of authority. They will not be suitable for all countries. However, countries wishing to bring a gender perspective to the agricultural census will find these concepts provide a useful basis for measuring the role of women in agriculture. The two concepts are very broad and countries will be able to adapt them to fit national circumstances and data requirements.

3.51. Countries will need to put considerable effort into developing suitable data collection methods and questions to identify sub-holdings and sub-holders in the agricultural census. The approach used by a country will depend on national agricultural practices and social and cultural conditions, taking into consideration the data collection methodology used for the rest of the agricultural census. Usually, a series of questions about each household member will be needed, to find out about the types of work each carried out on the holding and their role in managing agricultural production activities.

3.52. Data on sub-holdings and sub-holders are recommended for inclusion in the supplementary component of the agricultural census under Category 12: Management of the holding.

Agricultural census frame

3.53. In a statistical collection, the frame is the means by which the statistical units to be enumerated in the collection are identified; in this case, agricultural holdings. An ideal frame would be a list of all agricultural holdings, identifying each unit without omissions or duplications and without any units other than agricultural holdings. Such a list could be obtained through a population census, a farm register, or another source.

3.54. Where a farm register exists, it can be a good frame for an agricultural census provided it is regularly updated to remove units that cease to operate as holdings and to add new holdings. Usually, a register contains some basic information about each unit, such as some sort of size measure, which is updated periodically. Farm registers can be created in different ways. Sometimes, they are initially created at the time of an agricultural census and regularly updated thereafter using information from various sources.

3.55. For non-household agricultural holdings, frames may exist in the form of records from government regulatory agencies. Most countries have a business registration or licensing system. Membership information from industry associations may also be useful. Such frames can also be created by asking local officials to provide lists of agricultural units in their area of responsibility.

3.56. One problem with frames based on farm registers is that they are often established for administrative purposes and therefore may not be compatible with statistical needs. The unit on the register often does not correspond with the agricultural holding unit for the agricultural census. For example, the register may be based on cadastral or other land records where each parcel of land is identified, rather than the holding unit. Also, registers are usually based on land ownership, which is not always suitable to an agricultural census because several people in a household may own land separately. Also, the land owner is not the land operator if the land is rented out. Frames based on business registration or licensing procedures are not always suitable as they represent what the business is licensed to do, not what they actually do.

3.57. Another type of frame for the household sector of an agricultural census is one created from the population census as a one-time exercise, without it being kept up-to-date or maintained as a farm register afterwards. The population census could include additional questions on agriculture to help identify agricultural holdings for the agricultural census (see paragraphs 6.18-6.27). Alternatively, the identification of agricultural holdings in the household sector could be carried out as part of the cartographic work or pre-census listing exercise. For such a frame to be useful, the agricultural census would need to be undertaken as soon as possible after the population census to ensure that the list of agricultural holdings is accurate.

3.58. Another consideration with frames based on the population census is the statistical unit. Even if additional questions on agriculture are included in the population census or pre-census listing exercise, the frame would typically identify households engaged in own-account agricultural production, not agricultural

holdings. Such frames may still be useful for enumeration of the agricultural census as follows: (i) contact each household with own-account agricultural production for the agricultural census; (ii) ask each household with own-account agricultural production about the management of agricultural activities in the household to identify each agricultural holding; and (iii) enumerate all agricultural holdings for the agricultural census.

3.59. Even a list of all households from the population census can provide a useful frame for an agricultural census, as follows: (i) contact each household for the agricultural census; (ii) ask each household about the household's own-account agricultural production activities and the management of agricultural activities in the household, to identify each agricultural holding; and (iii) enumerate all agricultural holdings for the agricultural census.

3.60. Where a frame of agricultural holdings, households with own-account agricultural production, or households is unavailable from an existing farm register or the population census, it is usually not worthwhile creating a frame in this form just for the agricultural census. Instead, a different type of frame is used. First, the country is divided into suitable geographical units, called enumeration areas (EAs), covering the whole in-scope national territory. Then, each EA is visited to identify all agricultural holding units through interviews with local authorities or visits to each household. Population censuses are usually done using this type of frame and it is often possible for the agricultural census to piggyback onto the population census field system by using the same EAs and making use of maps and other field materials.

3.61. An EA is a geographical unit of suitable size to organize the census data collection – typically, 50 to 100 households. An EA could correspond to existing administrative units, such as villages. Often, it is necessary to subdivide administrative units to form suitable sized units. This is done by examining existing maps and administrative records, with field inspection undertaken as required. Aerial photographs and satellite imagery can also be useful in forming EAs.

3.62. Typically, a combination of frames is used for the agricultural census. Often, the household sector is enumerated based on the population census EA frame, whereas a frame of agricultural holdings in the non-household sector is obtained from administrative sources.

3.63. Care is needed in establishing frames for the agricultural census to ensure that all agricultural production units are covered. If agricultural holdings are missing from the frame, they will not be enumerated in the agricultural census and the validity of the census results will be compromised. This is especially important in an integrated agricultural statistical system, as any weaknesses in the agricultural census frame will be reflected in all the surveys that follow.

Complete and sample enumeration methods

3.64. From the start, agricultural censuses were intended to be censuses in the traditional statistical sense; that is, a complete enumeration of all agricultural holdings in a country. Complete enumeration collections are costly and difficult to manage in comparison to a sample survey. However, there have been several key reasons for using a complete enumeration approach for the collection of structural data in the agricultural census.

3.65. First, data can be produced for small administrative units such as districts or villages. Such detailed data are usually not possible from sample surveys because the sample estimates at this level are based on small sample sizes and are therefore subject to high sampling errors.

3.66. Second, a census enables more detailed cross-tabulations to be produced than is possible from a sample survey. For example, in a census, the number of holdings could be cross-tabulated by area of holding, household size and number of livestock; this level of detail may not be possible in a sample survey because of high sampling errors.

3.67. Third, a census can measure rare events such as the area of rarely grown crops or the number of unusual types of livestock. In a sample survey, few of these cases would be picked in the sample and therefore the data would be subject to high sampling errors.

3.68. In recent years, many countries have carried out the agricultural census using a sampling approach, and this has limited the amount of sub-national and other finely-classified data able to be produced. Usually, sample sizes have been large enough to retain many of the attributes of a full census providing district data, even if finer level data such as for villages could not be provided.

3.69. WCA 2010 provides for a combination of complete enumeration and sample methods. Complete enumeration in the core census module is needed to provide the detailed data for the key items, as well as sampling frames. However, it is recognised that it may not be possible for some countries to use complete enumeration, even for a limited set of key items, and sampling methods may need to be employed.

3.70. It is not possible to give specific recommendations on the required sample size for a sample-based core census module. Usually, the sample should be big enough to provide data down to the third level of administration – for example, at the national, province and district levels – and to provide suitable sampling frames. Other factors, such as the sample design, agricultural conditions in the country, the data content of the census, and the administrative structure of the country are also important. For example, if data are required for each of 100 districts, the sample size may need to be at least 25,000 holdings.

3.71. It is expected that the sample sizes for the census supplementary modules will be relatively small, but will depend on data requirements and the factors mentioned in the previous paragraph.

Agricultural census reference period

3.72. The census reference period is a period of twelve months, usually either a calendar year or an agricultural year, generally encompassing the various time reference dates or periods of data collection for individual census items. This reference period applies to both the core and supplementary modules of the agricultural census. Other agricultural surveys can be undertaken any time after the census.

3.73. The reference period for agricultural census items varies according to the type of data. The reference periods are usually the day of enumeration (for inventory items) or a twelve-month reference period (for continuing activities). The agricultural year is usually the most suitable reference period because respondents find it easier to think of their agricultural activities in terms of seasonal activities.

3.74. Sometimes, the agricultural census is carried out over an extended period of time, because of a shortage of enumerators or other field staff. Certain regions of a country may be enumerated at different times of the year because of seasonal and agricultural conditions. Countries need to establish suitable census reference periods to deal with these problems.

Field organization of census core and supplementary modules

3.75. The core and supplementary module(s) can be implemented as part of a single data collection operation, with the enumerator interviewing each holder to collect data for both the core and supplementary census modules at the same time. This may be done using a single questionnaire or separate questionnaires for each module. Typically, the enumerator's job is to:

- Collect data for the core census module.
- Apply specific sampling procedures, based on responses to the core census questions, to determine whether the holding is included in the supplementary module(s). A separate sampling scheme is used for each module. For example, with supplementary modules on aquaculture and livestock, the sampling procedures might require that, in certain pre-assigned sample EAs, each holding with aquaculture is included in the aquacultural module and each holding with livestock is included in the livestock module.
- If the holding is included in the sample for the supplementary module(s), proceed to ask the additional questions required for the supplementary module(s). Otherwise, the interview is finished.

3.76. Alternatively, the core and supplementary module(s) can be done separately. Here, the core census is undertaken first, with the core questionnaires being returned to the office for use in selecting the sample for the supplementary modules. Enumerators then return to the field to carry out the census supplementary module(s). In cases where the supplementary modules are carried out over a period of time, some updating of the census frame may be necessary, in advance of the field work.

Steps in developing an agricultural census

3.77. Information on how to develop and conduct an agricultural census is given in *Conducting Agricultural Censuses and Surveys* (FAO, 1996a). The basic steps are:

- Determine the overall strategy for the agricultural census as part of the system of integrated agricultural censuses and surveys.
- Define the objectives of the agricultural census.
- Develop a work plan and budget for developing and carrying out the census.
- Prepare census legislation, if required.
- Form a National Census Committee to oversee the census.
- Develop and implement the census publicity campaign.
- Create the Agricultural Census Office and recruit the necessary staff.
- Prepare frames.
- Prepare maps for census field operations.
- Develop the tabulation plan.
- Design and test questionnaires.
- Design and test the computer processing system, including data entry, editing and tabulation.
- Prepare field instruction manuals.
- Develop the field system; recruit and train field staff.
- Census enumeration.
- Data processing.
- Undertake quality control checks on the data.
- Tabulate and analyse the data.
- Prepare census reports and disseminate results.
- Reconcile the census data with the data from the system of current statistics.

CHAPTER 4

LIST OF ITEMS FOR THE CENSUS OF AGRICULTURE

This chapter contains recommended items for inclusion in the census of agriculture according to their suitability for the core and supplementary modules. The supplementary items are presented under 12 headings or themes, corresponding to areas of interest for the census supplementary modules. The reference group for each theme is shown, along with cross-references to the concepts and definitions in Chapter 11.

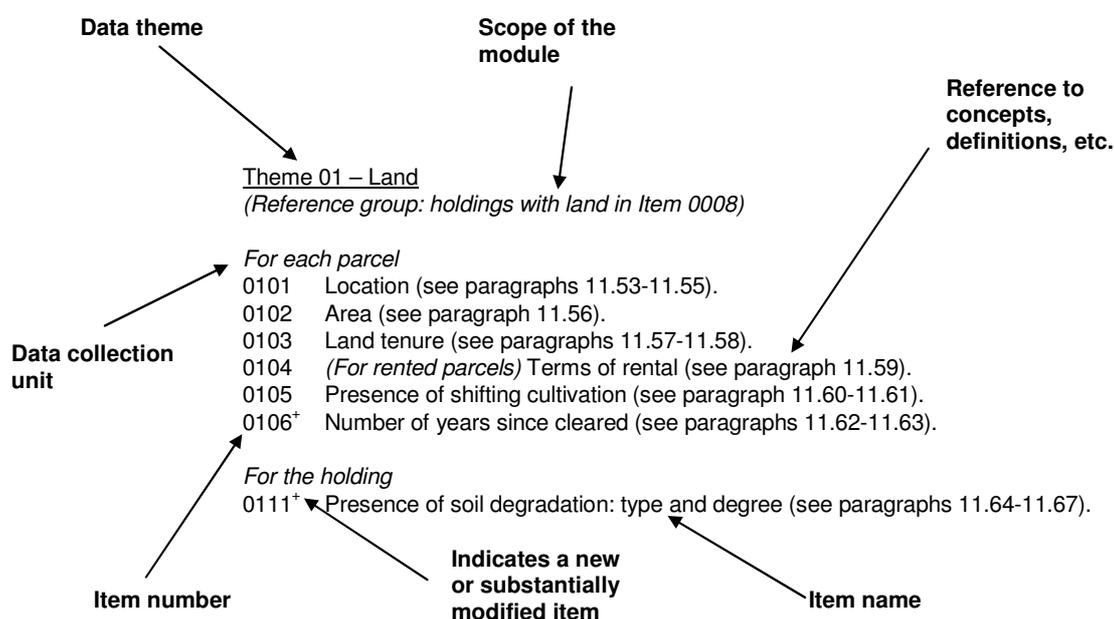
Introduction

4.1. This chapter lists the recommended items for the census of agriculture. The list has been prepared by FAO based on experiences of countries with previous agricultural censuses, taking into account agricultural issues and problems faced by countries. The chapter relates only to the core and supplementary modules; items for the community survey are shown in Chapter 5.

4.2. As discussed in Chapter 1, agricultural censuses for the 2010 round are to be carried out using a modular approach, with a core census module based on complete enumeration to provide key data, and one or more census supplementary modules to cover more in-depth topics. In this chapter, items are presented under two headings: (i) items recommended for inclusion by all countries in the core census module; and (ii) items to be considered by countries for inclusion in the census supplementary modules. The supplementary items are presented under 12 headings or themes. For information on how countries will choose items for inclusion in their agricultural census, see paragraphs 3.16–3.21.

4.3. A guide to interpreting the list of items is shown in Figure 4.1. For the supplementary modules, the scope of each theme is shown in parenthesis under each heading. For example, the scope of a land supplementary module (Theme 01) would be “holdings with land”, as identified from Item 0008 in the core module. References to the applicable concepts and definitions in Chapter 11 are shown in parenthesis after each item. Items that are new or substantially modified are also highlighted.

Figure 4.1: Guide to the list of agricultural census items



Items recommended for the core module¹

- 0001 Identification and location of agricultural holding (see paragraphs 11.4–11.6).
- 0002⁺ Legal status of agricultural holder (see paragraphs 11.7–11.10).
- 0003 Sex of agricultural holder (see paragraphs 11.11–11.13).
- 0004 Age of agricultural holder (see paragraphs 11.14–11.16).
- 0005 Household size (see paragraphs 11.206–11.209).
- 0006 Main purpose of production of the holding (see paragraphs 11.173–11.175).
- 0007 Area of holding according to land use types (see paragraphs 11.20–11.39).
- 0008 Total area of holding (see paragraphs 11.40–11.45).
- 0009 Land tenure types on the holding (see paragraphs 11.46–11.52).
- 0010 Presence of irrigation on the holding (see paragraphs 11.68–11.72).
- 0011 Types of temporary crops on the holding (see paragraphs 11.91–11.94).
- 0012 Types of permanent crops on the holding and whether in compact plantations (see paragraphs 11.95–11.98).
- 0013 Number of animals on the holding for each livestock type (see paragraphs 11.148–11.152).
- 0014 Presence of aquaculture on the holding (see paragraphs 11.292–11.296).
- 0015⁺ Presence of forest and other wooded land on the holding (see paragraphs 11.312–11.313).
- 0016 Other economic production activities of the holding's enterprise (see paragraphs 11.17–11.19).

Items for consideration for the supplementary modules

Theme 01 – Land

(Reference group: holdings with land in Item 0008)

For each parcel

- 0101 Location (see paragraphs 11.53–11.55).
- 0102 Area (see paragraph 11.56).
- 0103 Land tenure (see paragraphs 11.57–11.58).
- 0104 *(For rented parcels)* Terms of rental (see paragraph 11.59).
- 0105 Presence of shifting cultivation (see paragraph 11.60–11.61).
- 0106⁺ Number of years since cleared (see paragraphs 11.62–11.63).

For the holding

- 0111⁺ Presence of soil degradation: type and degree (see paragraphs 11.64–11.67).

Theme 02 – Irrigation and water management

(Reference groups: Items 0201–0205 – holdings with irrigation in Item 0010; Item 0206 – holdings with temporary crops or permanent crops in Items 0011 and 0012; Item 0207 – holdings with land in Item 0008).

For the holding

- 0201⁺ Area of land irrigated according to land use type (see paragraphs 11.73–11.75).
- 0202⁺ Area irrigated according to method of irrigation (see paragraphs 11.76–11.79).
- 0203⁺ Area irrigated for each crop type (see paragraphs 11.80–11.81).
- 0204⁺ Sources of irrigation water (see paragraphs 11.82–11.83).
- 0205⁺ Payment terms for irrigation water (see paragraph 11.84).
- 0206⁺ Other types of water management practices (see paragraphs 11.85–11.88).
- 0207 Presence of drainage equipment (see paragraphs 11.89–11.90).

¹ If the agricultural census is conducted in conjunction with the aquacultural census, an additional core item on area of aquaculture by type of site is included (see paragraph 7.20).

Theme 03 – Crops

(Reference groups: Items 0301–0303 – holdings with temporary crops in Item 0011; Items 0311–0314 – holdings with permanent crops in Item 0012; Items 0321–0327 – holdings with temporary crops or permanent crops in Items 0011 and 0012).

For each temporary crop type

- 0301 Area of temporary crops harvested (see paragraphs 11.99–11.111).
- 0302⁺ (For selected crop types) Area of temporary crops harvested according to end-use (see paragraphs 11.112–11.114).
- 0303⁺ (For selected crop types) Production of temporary crops harvested (see paragraphs 11.115–11.116).

For each permanent crop type

- 0311 Area of productive and non-productive permanent crops in compact plantations (see paragraphs 11.117–11.121).
- 0312 (For tree crops) Number of permanent crop trees in compact plantations and scattered plantings (see paragraphs 11.122–11.123).
- 0313⁺ (For selected crop types) Area of productive permanent crops in compact plantations according to end-use (see paragraphs 11.124–11.125).
- 0314⁺ (For selected crop types) Production of permanent crops (see paragraph 11.126).

For the holding

- 0321⁺ Area of land used to grow temporary crops as a secondary land use (see paragraphs 11.127–11.129).
- 0322 Use of each type of fertilizer (see paragraphs 11.130–11.137).
- 0323⁺ Area fertilized for each type of fertilizer and major crop type (see paragraph 11.138).
- 0324⁺ Source of seed inputs for each major crop type (see paragraphs 11.139–11.140).
- 0325⁺ Type of seed for each major crop type (see paragraphs 11.141–11.143).
- 0326⁺ Area of nurseries (see paragraphs 11.144–11.145).
- 0327 Area of cropped land under protective cover (see paragraphs 11.146–11.147).

Theme 04 – Livestock

(Reference group: holdings with livestock in Item 0013)

For the holding

- 0401 Type of livestock production system (see paragraphs 11.153–11.155).
- 0402⁺ Use of veterinary services (see paragraphs 11.156–11.157).

For each livestock type

- 0411 Number of animals: age and sex (see paragraphs 11.158–11.160).
- 0412 Number of animals according to purpose (see paragraphs 11.161–11.162).
- 0413⁺ Number of milking animals according to milk status (see paragraph 11.163).
- 0414⁺ Number of animals born (see paragraph 11.166).
- 0415⁺ Number of animals acquired (see paragraph 11.167).
- 0416⁺ Number of animals slaughtered (see paragraph 11.168).
- 0417⁺ Number of animals disposed of (see paragraph 11.169).
- 0418⁺ Number of animals died from natural causes (see paragraph 11.170).
- 0419⁺ Types of feed (see paragraphs 11.171–11.172).

Theme 05 – Agricultural practices

(Reference group: all holdings)

For the holding

- 0501⁺ Use of agricultural pesticides (see paragraphs 11.176–11.177).
- 0502⁺ Use of good agricultural practices (see paragraphs 11.178–11.179).
- 0503⁺ Use of organic agricultural practices (see paragraphs 11.180–11.182).

- 0504⁺ Use of genetically modified crops according to crop type (see paragraph 11.183).
- 0505 Selected machinery and equipment used on the holding according to source (see paragraphs 11.184–11.186).
- 0506 Non-residential buildings according to use (see paragraphs 11.187)
- 0507⁺ Percentage of each major agricultural product sold (see paragraph 11.188).

Theme 06– Agricultural services

(Reference group: holdings in sector “single-holding household” in Item 0002)

For the holding

- 0601⁺ Receipt of credit for agricultural purposes (see paragraphs 11.189–11.191).
- 0602⁺ Source of credit (see paragraph 11.192).
- 0603⁺ Type of collateral for credit (see paragraphs 11.193–11.194).
- 0604⁺ Period of loan or credit (see paragraph 11.195).
- 0605⁺ Sources of agricultural information (see paragraphs 11.196–11.197).
- 0606⁺ Sources of agricultural extension services (see paragraphs 11.198–11.202).
- 0607⁺ Travelling time to nearest periodic or permanent agricultural produce market (see paragraphs 11.203–11.205).

Theme 07 – Demographic and social characteristics

(Reference group: holdings in sector “single-holding household” in Item 0002)

For the holding

- 0701⁺ Whether holding is part of an agricultural household (see paragraphs 11.210–11.214).
- 0702⁺ National/ethnic group of household head or agricultural holder (see paragraphs 11.215–11.216).

For each household member

- 0711 Sex.
- 0712 Age (see paragraph 11.217).
- 0713⁺ Relationship to household head or other reference person (see paragraphs 11.218–11.220).
- 0714 Marital status (see paragraphs 11.221–11.223).
- 0715 Educational attainment (see paragraphs 11.224–11.225).

Theme 08 – Farm labour

(Reference group: Items 0801–0814 – holdings in sector “single-holding household” in Item 0002; Items 0821–0823 – all holdings)

For each household member of working age

- 0801⁺ Activity status (see paragraphs 11.234–11.240).

For each economically active household member

- 0811⁺ Status in employment of main job (see paragraphs 11.241–11.246).
- 0812 Occupation of main job (see paragraphs 11.247–11.252).
- 0813⁺ Time worked in main job (see paragraphs 11.253–11.258).
- 0814⁺ Time worked on the holding (see paragraphs 11.253–11.258).

For the holding

- 0821 Number of employees on the holding: time worked and sex (see paragraphs 11.259–11.264).
- 0822⁺ Form of payment for employees (see paragraph 11.265).
- 0823⁺ Use of contractors for work on the holding according to type (see paragraphs 11.266–11.268).

Theme 09 – Household food security*(Reference group: holdings in sector “single-holding household” in Item 0002)**For the household*

- 0901⁺ (a) Whether household members could not afford to eat what they normally eat at any time during a twelve-month reference period.
 (b) Months in which food shortage occurred.
 (c) Reasons for food shortage.
 (d) How the household’s eating patterns were affected by food shortage.
 (e) Steps taken to alleviate food shortage.
 (see paragraphs 11.275–11.280).
- 0902⁺ Whether the household fears a food shortage during a future twelve-month reference period (see paragraphs 11.281–11.282).
- 0903⁺ Frequency of normally eating selected food products (see paragraphs 11.283–11.284).
- 0904⁺ Effects of natural disasters (see paragraphs 11.285–11.287).
- 0905⁺ Extent of loss of agricultural output due to natural disasters (see paragraphs 11.288–11.289).

For children aged under 5 years

- 0911⁺ Height and weight (see paragraphs 11.290–11.291).

Theme 10 – Aquaculture*(Reference group: holdings with aquaculture in Item 0014)**For the holding*

- 1001⁺ Area of aquaculture according to type of site (see paragraphs 11.297–11.300).
- 1002⁺ Area of aquaculture according to type of production facility (see paragraphs 11.301–11.306).
- 1003⁺ Type of water (see paragraphs 11.307–11.308).
- 1004⁺ Sources of water for aquaculture (see paragraph 11.309).
- 1005⁺ Type of aquacultural organism cultivated (see paragraphs 11.310–11.311).

Theme 11 – Forestry*(Reference group: holdings with forest and other wooded land in Item 0015)**For the holding*

- 1101 Area of forest and other wooded land as primary land use (see paragraph 11.314).
- 1102 Area of forest and other wooded land as a secondary land use on agricultural land (see paragraph 11.315).
- 1103⁺ Main purpose of forest and other wooded land (see paragraphs 11.316–11.317).
- 1104⁺ Whether agro-forestry is practised (see paragraphs 11.318–11.319).

Theme 12 – Management of the holding*(Reference group: holdings in sector “single-holding household” in Item 0002)**For each holding*

- 1201⁺ Identification of sub-holdings (see paragraph 11.320).
- 1202⁺ Identification of sub-holders (see paragraph 11.320).

For each sub-holding

- 1211⁺ Sex of sub-holder (see paragraphs 11.321–11.322).
- 1212⁺ Age of sub-holder (see paragraphs 11.321–11.322).
- 1213⁺ Area of crops managed for each crop group (see paragraphs 11.323–11.328).
- 1214⁺ Number of livestock managed for each livestock group (see paragraphs 11.325–11.328).

CHAPTER 5

COMMUNITY-LEVEL DATA

A new element of the 2010 round of agricultural censuses is the collection of community-level data. This chapter outlines the purpose of collecting community-level data and discusses the items suitable for inclusion in the community survey. Some methodological issues are also discussed.

Introduction

5.1. Past agricultural census programmes have focused on data on the structure of agricultural holdings collected directly from each agricultural holding. These structural data concern matters that are decided upon by the holding, such as what crops to grow and what agricultural inputs to use, and therefore can only be reported by the holding itself, not by public administrations.

5.2. However, some types of administrative data are of interest in an agricultural census, especially for decentralized planning, identification of poor villages, planning of targeted area development programmes, and targeting communities for relief operations in case of natural disasters. A community-level data collection, often at the village or the commune level, can be useful for examining the infrastructure and services available to holdings. Data on whether the community is prone to natural disasters or subject to seasonal food shortages can be of interest for food security analysis. A community survey may cover agriculture-related data not able to be collected from holdings, such as the area of communal land. Often, the community-level data complements the holding-level data; for example, community-level data on the existence of farmers' associations may complement data on participation in those associations collected from each agricultural holding. For information on previous work done by FAO on community-level statistics, see *Community-level Statistics* (FAO, 1983).

5.3. There is a strong demand for community-level data in the agricultural census and, to meet this need, a community-level component has been included in WCA 2010. Countries are encouraged to include this element according to national circumstances and data requirements. Community-level data are of statistical interest for three main reasons.

5.4. First, the data are of interest in their own right in analyzing the characteristics of communities. For example, data on the percentage of communities with an agricultural input supplier can be useful in understanding farmers' constraints in the adoption of improved agricultural practices. Population or household characteristics, such as the number of people living in communities prone to natural disasters, can also be estimated.

5.5. Second, the data can be useful for analysis in relation to holding-level data. For example, one could tabulate the number of holdings growing particular cash crops against whether or not an agricultural produce market exists in the community, to help understand the way farmers' cropping patterns are influenced by access to markets. Similarly, tabulating the number of holdings participating in farmers' associations in communities where such organizations exist can help to highlight the effectiveness of those organizations.

5.6. Third, data from a community survey may be of interest for checking holding-level data collected in the agricultural census. Often, cadastral information is used for this purpose.

5.7. One factor in the collection of community-level data in the agricultural census is that it is usually necessary to make contact with the community administration in carrying out the census fieldwork. Sometimes, the community administration is involved in the census data collection itself or the listing of households or holdings. In these circumstances, community-level data can be collected at little cost.

Defining a community

5.8. A community can be defined as a self-contained unit of social and economic activities (FAO, 1983). Housing censuses use the similar concept of locality, which is “a distinct population cluster that has a name or a locally recognized status” (UN, 1998b, paragraphs 2.49–2.51). Under these definitions, the community or locality may not be the same as the lowest administrative unit.

5.9. For statistical purposes, the unit chosen for the community survey should take account of operational factors and the circumstances of the country.

- Data collected. Often, the data requires that the community maintains certain administrative records, which are usually only available for administrative units, commonly the village or commune. Sometimes, the lowest administrative unit has no substantial administrative function, and the community unit may need to be defined at a higher level.
- Cost. The data collection and processing task must be manageable and this may influence whether to collect data at, for example, the commune or village level.
- Identifying community units. Most countries maintain lists of community units down to a certain level. Ready access to such information is needed to do a community survey.
- Stability of community units. In many countries, changes in administrative units are common and not well-coordinated, making it difficult to carry out a community survey.
- Census methodology. If EAs for the census fieldwork are based on the commune unit, for example, it would be easiest to also collect community-level data at that level. Problems may arise if EAs cross locality boundaries.

5.10. Deciding on the scope of a community survey is another issue. Normally, countries do not cover all communities in the country as part of the agricultural census, but limit the collection to those communities containing agricultural holdings. This is convenient operationally as field staff need to visit those communities to enumerate the holdings. Covering only rural communities may not be fully satisfactory because some agricultural holdings are in urban areas. Countries should endeavour to cover at least all rural communities.

5.11. Community surveys are only applicable in countries with a suitable community-level organization. Sometimes, rural areas are not organized into communities. Even if they are, the communities may not have clear-cut physical boundaries or the community administration may be weak.

Community-level items

5.12. Many types of data are of possible interest for the community survey, and it is not possible to make specific recommendations on the community-level items each country should include in its census. Some general guidelines are provided in this section. The content of the community survey should be determined taking into account data needs and the availability of community-level data from other sources.

5.13. Countries should make every effort to coordinate community-level data from the different sources. Many countries maintain a community register or database, sometimes based on the population census. Provided a common geographic coding system is used, the agricultural census can be linked with existing community databases, so that there is no need to duplicate data already available. All community-level data collections should be coordinated, so that a series of linked community databases would be available covering specific areas of interest, such as agriculture, health and population. The agricultural census could then focus on just the agriculture-related data.

5.14. Other issues to be considered in deciding on the content of the community survey are:

- The community survey should not be used for collecting holding-level data. The holdings themselves grow crops and raise livestock, and these data should be collected directly from holdings, not by asking a community official to provide estimates. For example, the community administration cannot report on how many people are literate, as it has no way of knowing this information. If these data are required, it is better to directly ask households

some literacy-related questions. Note that population by age and sex at the national or regional level can be estimated from the holding-level collection, usually more accurately than from community records. This usually applies even if sampling is used.

- The collection of data directly from holdings is one of the features that distinguish an agricultural census from the administrative reporting systems used in many countries. The community survey should not be used to provide a quick and easy method of getting data that are better collected directly from holdings.
- Communities should not be asked to report the same data as holdings, unless the community-level data are required specifically for checking the data reported by holdings. Even here, it is often better to incorporate those data into the holding-level field system than to provide independent community-based data. For example, enumerators could correct area data reported by holdings by referring to the cadastral records.
- Community-level data are only useful if they can be presented in statistical summaries. Emphasis should be given to the tabulation needs in the design of the community survey. More information on tabulation for the community survey is given in paragraphs 12.30–12.37.
- The community-level items should be limited to key administrative information or aspects of the community that are well-known to people in the community, such as weather conditions, economic activities, and whether certain services exist.
- The number of community-level items should be kept to a minimum, normally, 10-20 items.

5.15. A list of possible items for inclusion in the community survey is given below. The list is not exhaustive. Some items may already be available in existing databases and would not need to be collected again in the agricultural census.

Geography

- 2101 Location
- 2102 Agro-ecological, climatic, topographical, or soil types
- 2103 Land use
- 2104 Area of communal grazing land
- 2105 Area of communal forest
- 2106 Travelling time to the nearest major urban centre (by season, if applicable)
- 2107 Whether the community has year-round access to the nearest urban centre by a motorable road
- 2108 Whether the community is prone to natural disasters, such as droughts and floods (if applicable)

Socio-economic conditions

- 2201 Population according to different population groupings
- 2202 Number of households
- 2203 Economic status (if applicable)
- 2204 Economic activities
- 2205 Whether there are seasonal food shortages (if applicable)

Community infrastructure and services

- 2301 Presence of a fertilizer dealer; if not, travelling time to the nearest fertilizer trading centre (by season, if applicable)
- 2302 Presence of a pesticides dealer; if not, travelling time to the nearest pesticides trading centre (by season, if applicable)
- 2303 Presence of a seed dealer; if not, travelling time to the nearest seed trading centre (by season, if applicable)
- 2304 Presence of a credit institution; if not, travelling time to the nearest credit institution (by season, if applicable)
- 2305 Presence of irrigation facilities
- 2306 Area equipped for irrigation

- 2307 Availability of veterinary services; if not, travelling time to the nearest veterinary services (by season, if applicable)
- 2308 Presence of a periodic or permanent agricultural produce market; if not, travelling time to the nearest periodic or permanent agricultural produce market (by season, if applicable)
- 2309 Existence of agricultural produce collection network
- 2310 Presence of food storage facilities.
- 2311 Presence of agricultural processing facilities
- 2312 Presence of facilities for maintaining agricultural machinery
- 2313 Existence of farmers' associations, cooperatives, and other bodies providing support and services to farmers.
- 2314 Availability of agricultural extension service
- 2315 Whether electricity is connected
- 2316 Presence of a primary school; if not, travelling time to the nearest primary school (by season, if applicable)
- 2317 Presence of a health facility; if not, travelling time to the nearest health facility (by season, if applicable)
- 2318 Presence of radio, telephone, and Internet services
- 2319 Availability of public transport: bus, train, boat

Development programmes

- 2401 Presence of specific development projects in the community

Concepts and definitions for community-level items

5.16. Location (Item 2101) is normally based on a geographic coding system (see paragraphs 11.4–11.6). This item is needed to summarize the data by geographical groupings, to relate the data to holding-level data, and to link community databases.

5.17. Agro-ecological, climatic, topographical, or soil types (Item 2102). Countries may have one or more standard groupings of areas, which may reflect different agricultural conditions, climatic conditions, or even living standards and ethnic groups.

5.18. Land use (Item 2103) should be compatible with the classification used in the holding-level collection (see paragraphs 11.20–11.39). Land use data at the community level may be shown in more detail, such as showing land under water or identifying different forest types. Land use at the community level provides a comprehensive picture of all land in the community, not just the land operated by holdings as obtained in the holding-level collection.

5.19. Area of communal grazing land (Item 2104) and area of communal forest (Item 2105) help to fill in the gaps from the holding-level collection.

5.20. Travelling time to the nearest major urban centre (Item 2106). Travelling time data provide a good picture of the isolation of the community, and the effect this has on people's agricultural practices and living standards. Travelling time may differ between seasons, such as during the wet and dry seasons. The related item whether the community has year-round access to the nearest urban centre by a motorable road (Item 2107) helps to highlight the transportation problems faced by people in the community.

5.21. Whether the community is prone to natural disasters (Item 2108) is important for countries that face regular crises because of flooding or other natural disasters. This is often a major cause of food insecurity and may influence farmers' agricultural practices.

5.22. Population according to population group (Item 2201) can be useful in classifying the community by type, such as according to ethnic group. Population data can also be useful for providing population-based estimates based on the community-level data. Number of households (Item 2202) is used to provide household-based estimates for community-level data.

5.23. Economic status (Item 2203). In some countries, each community is assigned an economic

status measure, which can be useful to analyse holding-level characteristics in relation to whether the community is “rich” or “poor”.

5.24. Main economic activities (Item 2204) should be based on the classification of activities used in Item 0016 of the holding-level collection.

5.25. Whether there are seasonal food shortages (Item 2205). This item is suitable for countries where seasonal factors affect food supplies.

5.26. Community infrastructure and services (Items 2301–2319). Countries should choose items suited to national conditions. The key for these items is whether people have ready access to specific infrastructure and services in the community itself or in a nearby centre; hence, the travelling time component in many items.

5.27. Presence of specific development projects in the community (Item 2401). This item is of interest where specific government or other development programmes are implemented to raise living standards or for agricultural development. These programmes might be administered by the government, non-government organizations, international agencies, or on a bilateral basis. The data provided are of interest to evaluate the benefits of those programmes.

Methodological considerations

5.28. The approach used for the collection of community-level data in the agricultural census will depend on the organization of fieldwork for the collection of holding-level data. The fieldwork for an agricultural census is usually organized by dividing the country into suitable EAs (see paragraphs 3.60–3.61). EAs often correspond with administrative units such as villages, but this may not always be the level at which community-level data are required. Often, administrative units are sub-divided to form suitable sized EA units, making it difficult to coordinate the community- and holding-level collections.

5.29. Where the community administration prepares the list of households or holdings for the agricultural census, it may be possible to administer the community questionnaire at the same time. Often, census field staff personally visit each community to obtain the household/holding list, and this can provide a good opportunity to collect the community-level data.

5.30. Even if the community administration does not do the household/holding listing, it may be involved in the holding survey operation itself. Often, community officials are used to help locate each household. Sometimes, they help in interviewing households – for example, as translators. In these circumstances, the community questionnaire can be administered at a suitable time.

5.31. Consideration should be given to the suitability of collecting community-level data by mail, rather than by interview. The data collected should be simple enough for the community administrations to fill out the questionnaire themselves. Costs may be a factor in this regard.

5.32. Sampling methods will usually not be suitable for the community survey. If the core census module is done on a complete enumeration basis, the community survey should be done the same; to do a sample community survey in conjunction with a full enumeration core census of holdings would make it impossible to link holding-level and community-level data in all cases. This would limit the usefulness of the community-level data for census analysis purposes.

5.33. However, sampling methods may be suitable where the core module is done on a sample basis. In a typical sample-based core module, a sample of EAs is selected, household/holding lists are prepared for each sample EA, and then a sample of households/holdings is enumerated for the census. The same sample areas could be used for the community survey, on the basis that those EAs not selected in the sample are not contacted at all during the collection of holding-level data and would require a special visit to collect the community-level data. A sample community survey would be suitable for analysing holding-level data in relation to community-level data, as such analysis only requires community-level data from the communities containing the sample holdings. However, the sampling approach may not be suitable for summarizing community-level data.

CHAPTER 6

RELATIONSHIP OF THE CENSUS OF AGRICULTURE TO THE POPULATION CENSUS AND OTHER CENSUSES

A feature of WCA 2010 is the emphasis on coordinating the census of agriculture with other censuses, especially the population census. This chapter highlights the ways in which this can be done. Attention is given to the use of common definitions and classifications, sharing operational materials, use of the population census as a frame, synchronizing the two data collection operations, collecting additional agricultural data in the population census, and linking data from the two censuses. Coordination with housing and economic censuses is also discussed.

Relationship with the population census

Introduction

6.1. A population census is one of the most important statistical collections undertaken by a country. It provides the major source of basic information on the population of a country, its geographical distribution, and characteristics such as sex, age, marital status, fertility, education and economic activity. Population censuses enumerate all people in the country to collect these data. Normally, they are undertaken every ten years.

6.2. Guidelines for population and housing censuses are issued by the United Nations. The latest guidelines (UN, 1998) provide a set of “basic” topics, covering items included by most countries in their population censuses, such as sex, age, marital status, activity status and education. Some “optional” topics, such as income, are also included. New guidelines for the 2010 round of population and housing censuses are being prepared.

Options for coordinating the agricultural and population censuses

6.3. In many developing countries, households and agricultural holdings are closely related, because most agricultural production activities are in the household sector. This provides the opportunity for coordination between the two census activities in ways that can save costs and enhance the usefulness of the agricultural census data. This can take several forms:

- use of common concepts, definitions and classifications (see paragraph 6.8);
- sharing field materials (see paragraphs 6.9–6.10);
- using the population census as a household frame for the agricultural census (see paragraphs 6.11–6.13);
- making use of agriculture-related data from the population census (see paragraphs 6.14–6.17);
- collecting additional agriculture-related data in the population census (see paragraphs 6.18–6.27);
- linking data from the two censuses (see paragraphs 6.28–6.30);
- conducting the two censuses as a joint field operation (see paragraphs 6.31–6.35).

6.4. These are discussed in the following sections. Because population censuses cover households and not enterprises, the relationship between the agricultural and population censuses applies only to the

household sector. Separate frames for the non-household based agricultural holdings will need to be compiled as a separate exercise.

Statistical units in the agricultural and population censuses

6.5. The primary statistical unit for a population census is the household, whereas for an agricultural census it is the agricultural holding.

6.6. For the household sector, the agricultural holding and household units are usually closely related, but there are differences, which can make coordination between the two censuses difficult. Normally, there is only one agricultural holding in a household, but there can be two or more holdings in a household or two or more households operating a holding.

6.7. Equating the agricultural holding unit with the household unit is not essential to be able to relate the two census activities. Nevertheless, countries sometimes define the agricultural holding to be equivalent to the household to simplify the agricultural census field procedures. For more information on the concepts of household and holding, see paragraphs 3.22–3.35.

Use of common concepts, definitions and classifications

6.8. The use of common statistical standards in the agricultural and population censuses ensures that data from the two sources are consistent and comparable, making it easier to analyse and interpret agricultural census data in relation to population census data. Previous agricultural census programmes have given emphasis to ensuring that concepts, definitions and classifications used in the agricultural census accord with international standards and, where applicable, with those used in the population census. This has continued in the 2010 programme, and countries should give special attention to this aspect.

Sharing field materials

6.9. Agricultural censuses are often conducted after the population census and can, therefore, make good use of the various population census field materials. Where an agricultural census is carried out by enumerating EAs (see paragraphs 3.60–3.61), it can be based on the same EA boundaries as used in the population census and make use of maps and other field materials used in the population census. In developing field procedures for the agricultural census, countries should make maximum use of all available field materials from the population census and elsewhere.

6.10. A further use of the population census EAs is as a sampling frame for agricultural censuses conducted on a sample basis (see Chapter 10).

Using the population census as a household frame for the agricultural census

6.11. Some countries carry out the household component of the agricultural census using the list of households from the population census as a frame (see paragraph 3.57). This approach has several benefits, especially as it provides the opportunity to link data from the two censuses (see paragraphs 6.28–6.30). However, it can only be done if the agricultural census is carried out soon after the population census; otherwise, the list of households quickly becomes out-of-date and the list needs to be updated.

6.12. A common method of conducting an agricultural census core module using a household frame from the population census is:

- Construct the basic frame for the agricultural census from the list of households enumerated in the population census (if the agricultural census is carried out soon after the population census) or updated lists of households in population census EAs (if the agricultural census is carried out some time after the population census).

- In the agricultural census, ask each household some screening questions to identify households that are in scope of the agricultural census – that is, households with own-account agricultural production activities – and then ask all of these households questions to identify individual agricultural holdings.
- Enumerate each agricultural holding for the agricultural census.

6.13. Some features of this approach are:

- The list of households from the population census provides a good frame for the agricultural census, even though it only identifies households, not agricultural holdings or even households with own-account agricultural production. For more information, see paragraph 3.59.
- The approach clearly distinguishes, in the agricultural census, between data for households and data for agricultural holdings. This is an important element in linking data between the two censuses (see paragraph 6.30).
- Using this approach, it is easy to widen the scope of the agricultural census to cover, for example, all rural households (see paragraph 8.2).
- Household data from the population census are also useful for constructing a sampling frame for a sample-based core agricultural census (see paragraphs 10.38–10.41).

Existing agriculture-related data in the population census

6.14. In assessing data needs for the agricultural census, consideration should be given to the availability of existing agricultural data from other sources, to avoid duplication in data collection effort. Three items normally included in the population census are of special interest for agricultural analysis:

- Main occupation (see paragraphs 11.247–11.252; UN, 1998, paragraphs 2.12–2.20). This item is collected for each economically active person. It can be used to provide tabulations of persons working in an agricultural occupation. This includes household members of agricultural holdings working in an agricultural occupation (on the household's holding or another holding), as well as persons working as employees in an agricultural occupation.
- Main industry. Industry is the activity of the establishment in which the person works in his/her main job (UN, 1998, paragraphs 2.221–2.225). This item is collected for each economically active person, and can be used to provide tabulations of persons working in the agricultural industry. This includes household members of agricultural holdings working in the agricultural industry, as well as persons working as employees in the agricultural industry.
- Status in employment (see paragraphs 11.241–11.246; UN, 1998, paragraphs 2.226–2.235). This item refers to whether the person is working as an own-account worker, family worker or employee, and is collected for each economically active person. This is useful for analysing persons with an agricultural main occupation according to whether they are agricultural holders (an “own-account worker”), working on the household's holding (contributing family worker), or in paid agricultural work (employee).

6.15. One weakness in agricultural employment data from the population census is that they are normally collected in respect of a person's main activity during a short reference period, such as a month. This may not identify all persons working in agriculture, because of the seasonality of agricultural activities. Nevertheless, data on occupation combined with status in employment from the population census could be used to help establish a frame for the agricultural census. The following group of households, closely related to agricultural holdings, can be identified:

Households in which any household member has both: (i) an agricultural main occupation; and (ii) status in employment “own-account worker”.

6.16. A household satisfying these two conditions could be considered as a household engaged in own-account agricultural production activities. The two conditions relate to the main occupation of

household members. This will miss households with own-account agricultural production where no single household member has an agricultural main occupation. This could be significant in some countries.

6.17. A frame established in this way would not identify agricultural holdings. This is because there may not always be a one-to-one correspondence between households and holdings (see paragraphs 6.6–6.7). A frame of households with own-account agricultural production may be used for the agricultural census core module in a similar way to the household frame in paragraph 6.12; in particular:

- Construct the agricultural census frame from the list of households with own-account agricultural production from the population census (if the agricultural census is carried out soon after the population census) or updated lists of households with own-account agricultural production in population census EAs (if the agricultural census is carried out some time after the population census).
- In the agricultural census, ask each such household questions on agricultural production management (as well as area of holding and number of livestock, if necessary) to identify each agricultural holding.
- Enumerate each agricultural holding for the agricultural census.

Collecting additional agriculture-related data in the population census

6.18. A country may consider including additional agriculture-related items in its population census for two main reasons. First, the additional items can provide a wider range of agriculture-related data for the population census analysis. Second, the information can be used to help create the frame for the agricultural census. Note that, for a population census to be useful for agricultural census frame purposes, information from the population census needs to be available quickly. Special field and processing arrangements need to be put in place to provide the frame in time for the agricultural census.

6.19. Any additional agriculture-related data in the population census can also be useful for the sample design and selection for a sample-based agricultural census core module; for example, as a size measure for the sampling of EAs using probability proportional to size sampling. The information can also be useful in planning the agricultural census fieldwork; for example, information on the geographical distribution of households with own-account agricultural production can help in organizing enumerator workloads.

6.20. It is recommended that highest priority be given to inclusion of additional agriculture-related items in the population census **either** at the household level **or** at the individual (person) level. Alternatively, the required household level information can be collected in the pre-census listing or cartographic phase of the population census so as not to overburden the questionnaire. This later approach has the added advantage in that the frame for the census of agriculture can be compiled directly from the listing/cartographic exercise without having to wait for the questionnaire to be processed. .

Household data

H1: WHETHER THE HOUSEHOLD IS ENGAGED IN ANY FORM OF OWN-ACCOUNT AGRICULTURAL PRODUCTION

- Crop production
- Livestock production

H2: WHETHER THE HOUSEHOLD IS ENGAGED IN ANY FORM OF OWN-ACCOUNT AQUACULTURAL PRODUCTION

Person data

P1: CHARACTERISTICS OF ALL AGRICULTURAL JOBS DURING THE LAST YEAR

P2: CHARACTERISTICS OF ALL AQUACULTURAL JOBS DURING THE LAST YEAR

6.21. Item H1 is of interest for agricultural census frame purposes, as well as being useful for population census analysis. Two multiple-response categories, as shown, would indicate whether the household is engaged in own-account agricultural production in relation to crops or livestock or both crops and livestock.

Item H1 is not an easy item to collect in the population census, as it can be difficult for respondents to understand the notion of own-account agricultural production, as opposed to working as an agricultural employee. A series of questions may be needed. Agricultural production refers to activities in ISIC Groups 011, 012 and 013 (see Appendix 1). See paragraph 11.243 for the definition of an own-account worker.

6.22. Item H2 is a supplementary item on aquaculture that could be included in the population census if an aquacultural census is to be conducted in conjunction with the agricultural census. The main use of this information would be to provide a frame for the aquacultural census. It would also be useful for population census analysis. Aquacultural production refers to activities in ISIC Class 0502 (see Appendix 1). See paragraph 11.243 for the definition of an own-account worker.

6.23. Item P1 covers all agricultural jobs of household members over a longer period, typically a year (see paragraph 6.15), to give a more complete picture of labour inputs provided by household members to the agricultural holding. The information collected is normally limited to occupation and status of employment, but can also include other data such as main and secondary occupations and time worked. Item P1 can provide additional data for agriculture-related analysis of the population census. It can also be used to create a frame of households with own-account agricultural production for the agricultural census. This can be done by identifying the group of households in which any household member has, at some during the year: (i) a job with an agricultural occupation; and (ii) status in employment “own-account worker”. In Item P1, an agricultural job is defined as a job in the agricultural industry as defined by ISIC Groups 011, 012 and 013 (see Appendix 1).

6.24. Item P2 is a supplementary item on aquaculture that could be included in the population census if an aquacultural census is to be conducted in conjunction with the agricultural census. It is analogous to Item P1. An aquacultural job is a job in the aquacultural industry as defined by ISIC Class 0502 (see Appendix 1).

6.25. Note that a population census based frame of the type described in the previous paragraphs, would relate to households with own-account agricultural production, not to agricultural holdings. To identify agricultural holdings in the population census, further additional items on agricultural production management issues would be required. This is usually not feasible in a population census. Another problem with population census based frames is where certain size criteria, such as area of holding or number of livestock, are applied in identifying units to be covered by the agricultural census (see paragraphs 3.9–3.14). Usually, it is not feasible to include further items in the population census to enable the size criteria to be applied. Typically, the population census is used to identify all households with own-account agricultural production, with the conditions needed to identify agricultural holdings applied in the agricultural census questionnaire (see paragraph 6.17).

6.26. In some countries, the population census gives prominence to agriculture and it is possible to include a more detailed range of agriculture-related items. Other items that countries could consider for inclusion in the population census are:

- Total area of holding or area of agricultural land.
- Area harvested for each main crop.
- Number of each type of livestock.
- Time worked on own-account agriculture.

6.27. There are always heavy demands on the population census for the whole range of population, social and economic data, and it is often not possible to include additional agriculture-related items. There are constraints on the length of the questionnaire, the types of data collected, and the cost of data collection, as well as timing and operational factors. In developing their population censuses, countries need to determine priorities, taking into account the importance of agriculture to the national economy.

Linking data from the agricultural and population censuses

6.28. One of the benefits of coordinating the agricultural and population censuses is that it opens up the possibility of linking data between the two collections. Linking data means that a particular household or agricultural holding in the agricultural census is matched to the same unit in the population census, so that data from the population census can be used in the agricultural census tabulation and analysis. For example, size of holding could be tabulated against household composition, income, or other data from the population census. Linking data in this way adds considerable analytical value to data sets from both censuses.

6.29. The ability to link data from the two censuses can also save on data collection costs. Normally, various demographic and activity status data are collected in the agricultural census, even though they are also included in the population census, because the data are needed for tabulation purposes. If data from the two censuses could be linked, it would no longer be necessary to collect these data again in the agricultural census. This could affect the following agricultural census items:

Core items

0003 Sex of agricultural holder
0004 Age of agricultural holder
0005 Household size

Supplementary items

0701 National/ethnic group of household head or agricultural holder
0711 Sex of each household member
0712 Age of each household member
0713 Relationship to household head for each household member
0714 Marital status of each household member
0715 Educational attainment of each household member
0801 Activity status of each household member
0811 Status in employment for each economically active household member
0812 Occupation of main job for each economically active household member

6.30. Linking data is a complex statistical process, especially matching units between different statistical collections carried out at different times. The use of different statistical units in the two censuses also creates problems. Agricultural census data can only be linked to the population census through the household unit. Thus, for example, area of holding data from the agricultural census could be related to demographic data from the population census by associating the agricultural holding with a particular household in the agricultural census, and linking that household to the corresponding household in the population census. The possibility of more than one holding in a household also complicates the linking of data.

Conducting the two censuses as a joint field operation

6.31. Some countries conduct the data collection for the population and agricultural censuses as a joint field operation. Normally, each census retains its separate identity and uses its own questionnaire, but field operations are synchronized so that the two data collections can be done at the same time by the same enumerators. Occasionally, the two censuses are merged into one.

6.32. A common approach to the field work for a joint population/agricultural census is for the enumerator to:

- Interview each household to collect data for the population census, using the population census questionnaire.
- Ask the household a question (or questions) to determine if it is engaged in own-account agricultural production activities.
- If it is engaged in own-account agricultural production, collect data for the agricultural census

at the same time as, or soon after, the population census, using the agricultural census questionnaire. The questionnaire would include questions to identify each agricultural holding before going on to collect data on the agricultural activities for each holding.

6.33. Synchronizing the two census field operations in this way has several benefits:

- By doing the data collection for both censuses in a single field visit, the cost of data collection is reduced.
- It facilitates the use of the population census as a frame for the agricultural census, as it eliminates the problem of the population census household lists being out-of-date.
- It provides an immediate link between population and agricultural census household-level data. Demographic and economic activity status data required in the agricultural census can be obtained directly from the population census, rather than having to collect the data again as in a normal agricultural census, which results in further savings in data collection costs (see paragraph 6.29). The ability to link data also provides opportunities for wider analysis of both the population and agricultural censuses (see paragraph 6.30).
- Doing the data collection together makes it easy to apply standard concepts and definitions in the two censuses.
- There may be organizational benefits in having one enumeration team responsible for data collection in both censuses. Field training would be easier and a higher standard of enumeration work could be expected.

6.34. However, there may also be some problems in taking this approach. Countries usually face administrative problems in synchronizing the two census field operations, and special coordination arrangements need to be put in place to successfully carry out the joint operation. This is especially so if different government agencies are responsible for the two censuses. Another problem is that the population and agricultural censuses may need to be conducted at different times because of administrative or operational considerations. Care is also needed in designing field systems to ensure that bringing the two census field operations together does not affect data quality for either census.

6.35. Another problem in synchronizing the two censuses is that agricultural holdings in the non-household sector are not covered in the population census. These may need to be enumerated separately. However, sometimes the non-household sector is included in a combined census operation, as follows:

- Enumerators visit each EA to interview each household to collect population census data and, where applicable, agricultural census data.
- While in the EA, enumerators identify each agricultural holding in the non-household sector, using information from local sources. Enumerators then enumerate each non-household unit for the agricultural census.

Relationship with the housing census

6.36. Housing censuses provide information on the characteristics of housing units, such as size, construction materials, and available services (UN, 1998). A housing census is normally conducted in association with a population census, and here, any link between the agricultural and population censuses would also provide a link between the agricultural census and the housing census. This would enable data from the housing census to be used for tabulation and analysis of the agricultural census. Housing conditions often reflect the economic status of a household, and therefore housing data can provide useful indicators of poverty. This can add a valuable new dimension to the agricultural census analysis.

Relationship with economic censuses

6.37. The agricultural census is a component of the overall economic statistics system based on SNA and ISIC (see Appendix 1). Under SNA, all economic activities in a country are divided into industries, such as agriculture, manufacturing, etc. In designing their national statistical systems, countries usually carry out a series of industry-specific economic censuses, or conduct regular economy-wide censuses covering all industries. Under this framework, the agricultural census measures the agricultural industry.

6.38. Economic censuses are normally carried out using the "establishment" as the statistical unit (see Appendix 1). The definition of the agricultural holding is compatible with the establishment concept. This opens up the possibility of integrating the agricultural census into the economic census programme. This can take several forms.

6.39. Use of common concepts, definitions and classifications. Ensuring that the concepts, definitions and classifications used in the agricultural census are consistent with SNA principles ensures that agricultural census data are consistent with data from other economic censuses and surveys. Countries should give special attention to the use of international statistical standards.

6.40. Use of common frames. Often, countries maintain a register of business establishments, including agricultural establishments, for use in economic censuses and surveys. This can provide a good frame for the agricultural census. Often, these registers cover only the non-household sector and are used in the agricultural census to supplement the frame of household units available from the population census. Business registers usually contain certain basic information about each unit, which can be useful for the agricultural census.

6.41. Integrating the agricultural census into existing economic censuses. Sometimes, it is possible to incorporate the agricultural census into an existing economy-wide economic census. The modular approach used for the current round of agricultural censuses lends itself well to this approach. One option is to incorporate the core agricultural census module into an existing economic census, with agricultural census supplementary modules carried out, as required, based on the core census module.

6.42. Linking data between the agricultural and economic censuses. Coordinating the agricultural and economic censuses could provide the opportunity to link data between the different censuses. Linking data in this situation means that a particular agricultural holding in the agricultural census is matched to the same unit in an economic census, to enable data from the economic census to be used in the agricultural census tabulation and analysis.

Summary

6.43. It is not possible to give a unique set of recommendations to countries on relating the agricultural census with other censuses. Each country's circumstances are different, and the approach adopted will depend on the timing of the censuses, costs, data collection considerations, organizational arrangements for the censuses, and the existing coordination mechanisms. Particular emphasis should be given to the use of international standard concepts, definitions and classifications. Coordination with the population census should also be given particular attention, especially through sharing operational materials and using the population census as a frame for the agricultural census.

6.44. The opportunity for coordinating the various census activities should be actively explored at an early stage in the planning process, and be taken into consideration in developing national statistical plans. Countries should make the necessary administrative arrangements to ensure close collaboration between the census development teams and to ensure that all avenues for coordination are explored.

CHAPTER 7

COMBINING THE CENSUS OF AGRICULTURE WITH THE AQUACULTURAL CENSUS

WCA 2010 provides the option to carry out an aquacultural census in conjunction with the census of agriculture. This chapter discusses the main issues to be considered by countries in taking this approach. A proposal for an integrated census of agriculture and aquaculture is presented, based on the modular approach. The use of common concepts and definitions for the two censuses is discussed, and the potential for using a single core questionnaire for the collection of data for both censuses is highlighted.

Introduction

7.1. Aquaculture has become increasingly important in many countries, and there is a growing demand for data on the structure of the aquacultural production industry. Some countries collect aquacultural data as part of a general fisheries census, covering both capture fisheries and aquaculture. However, there is a strong interest in many countries to link aquaculture with agriculture by carrying out the agricultural and aquacultural censuses together.

7.2. Agriculture and aquaculture are seen to be closely related because:

- Aquaculture involves the raising of fish in captivity or cultivation of aquatic plants, which is analogous to raising of livestock or cultivation of crops under agricultural production.
- Aquaculture is often integrated with agricultural production, such as in rice-cum-fish culture.
- Aquaculture and agriculture commonly share the same inputs, such as machinery and labour.

7.3. Apart from the close links between agriculture and aquaculture, there are other advantages in carrying out a joint agricultural/aquacultural census:

- The cost of data collection for the two censuses is reduced.
- It can help to provide a link between agricultural and aquacultural data, enabling a wider analysis of data in both censuses.
- It makes it easy to apply standard concepts and definitions in the two censuses.
- There would be organizational benefits in having one enumeration team responsible for data collection in both censuses.

7.4. In the past, the only aquacultural data included in the agricultural census programme were a few items on aquacultural production carried out by agricultural holdings in association with agricultural production. This covered aquacultural activities integrated with agricultural production, or sharing the same inputs with agricultural production (see paragraph 11.292). Aquacultural data collected in this way have three main limitations:

- Aquaculture carried out independently of agricultural production is not included.
- Only limited data on the basic characteristics of aquacultural activities are collected, such as area, type, source of water, and type of organism. Data such as machinery and labour relate specifically to inputs used for agricultural production, which exclude many aquacultural inputs. Also, area of holding may not fully reflect land used for aquaculture.

- The statistical unit for an agricultural census is the agricultural holding, whereas aquacultural data should relate to the economic unit of aquacultural production.

7.5. WCA 2010, like the previous programmes, covers only agricultural production units, with aquacultural data limited to activities associated with agriculture. However, for the first time, WCA 2010 provides the option to conduct an aquacultural census at the same time as the agricultural census to cover all aquacultural production. Countries are strongly urged to take this option if aquaculture is an important economic activity.

7.6. It is not possible, in this document, to fully describe the concepts, definitions and methodology for aquacultural censuses. This chapter focuses on the main issues to be considered by countries in carrying out the two censuses together, with particular reference to the use of the modular approach. More information on the collection of aquacultural statistics may be found in *Guidelines on the Collection of Structural Aquaculture Statistics* (FAO, 1997b).

Scope of the aquacultural census

7.7. According to ISIC (Rev. 3.1), agriculture and aquaculture are separate economic activities. Aquacultural production represents activities under ISIC Class 0502, whereas agricultural production is covered under the three ISIC Groups: 011, 012 and 013 (UN, 2004b). An aquacultural census therefore covers economic units in ISIC Class 0502, whereas an agricultural census covers economic units in ISIC Groups 011, 012 and 013. Statistically, the two censuses are separate, but operationally, they can often be combined into a single field enumeration system. Such a joint census is referred to as a census of agriculture and aquaculture.

7.8. Aquaculture is the farming of aquatic organisms such as fish, crustaceans, molluscs and plants, as opposed to other forms of aquatic exploitation such as capture fisheries. For more information on the definition of aquaculture, see paragraphs 11.292–11.295. A clear distinction is made between aquaculture and capture fisheries. Data on capture fisheries are rarely collected along with an agricultural census because it is analogous to hunting and gathering, which is usually out of scope of the agricultural census.

Statistical unit for the aquacultural census

7.9. The statistical unit for the aquacultural census is the aquacultural holding, defined in a similar way to an agricultural holding as follows:

“An aquacultural holding is an economic unit of aquacultural production under single management, comprising all aquaculture facilities without regard to title, legal form, or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households, by a clan or tribe, or by a juridical person such as a corporation, cooperative or government agency. The aquacultural holding’s aquaculture facilities are located in one or more separate areas or in one or more territorial or administrative divisions, providing the facilities share the same production means, such as labour, buildings and machinery.”

7.10. Agricultural holdings and aquacultural holdings are distinct establishment units operating in different industries under the SNA/ISIC framework (see Appendix 1). However, they may be closely related in that they may be part of the same enterprise; for example, a household may contain both an agricultural holding and an aquacultural holding. An agricultural holding and an aquacultural holding may also share the same inputs such as land, machinery and labour; for example, as in rice-cum-fish culture.

7.11. An agricultural holding may have some own-account aquacultural production as a secondary activity. However, this should be small-scale compared with the agricultural holding’s principal agricultural production activity. If aquaculture is as important, or nearly as important, as the agricultural production activity, two units should be formed: an agricultural holding and an aquacultural holding. The same situation applies to an aquacultural holding also engaged in own-account agricultural production activities.

Basic approach for the aquacultural census

7.12. It is recommended that aquacultural censuses use the same modular approach as for agricultural censuses, with the core module providing a limited set of key data on the structure of aquacultural holdings and a sample-based supplementary module providing more detailed structural data. This approach offers a cost-effective way of producing a wide range of aquacultural data.

7.13. The agricultural census core items relate to basic structural data, such as household size and land use, and these should also be included in the aquacultural census. It is recommended that one additional aquaculture-related item – area of aquaculture by type of site – be included in the core aquacultural census module (see paragraph 7.20). The use of a common set of core items for the agricultural and aquacultural censuses may make it possible to conduct the core modules of the two censuses using the same questionnaire.

7.14. The sample-based supplementary module should include the same aquacultural items as under Theme 10 of the agricultural census (see paragraphs 11.297–11.311). A typical aquacultural module would also include items from other themes such as crops and economic activity of household members.

Methodology for a census of agriculture and aquaculture

7.15. This section presents a broad outline of the methodology for the joint census of agriculture and aquaculture and discusses the implications for the item definitions of combining the two census operations. Information on tabulations for a census of agriculture and aquaculture is given in Chapter 12.

Core module

7.16. The frame for the core modules of the census of agriculture and aquaculture can be created in various ways:

- Use a frame of households from the population census to provide the basis for identifying agricultural holdings and aquacultural holdings in the household sector in the census of agriculture and aquaculture.
- Include additional questions in the population census to identify households engaged in own-account agricultural production and/or own-account aquacultural production.
- Develop a frame of agricultural and/or aquacultural holdings from administrative sources, such as business registrations. This may be applicable for the non-household sector.

7.17. Usually, a combination of frames is used for a census of agriculture and aquaculture. The methodology used for the joint census will depend on the type of frame. If the frame for the household sector is based on households from the population census, the core modules would be conducted as follows:

- Construct the basic frame of households for the census of agriculture and aquaculture from the list of households enumerated in the population census (if the census of agriculture and aquaculture is carried out soon after the population census) or updated lists of households in population census EAs (if the census of agriculture and aquaculture is carried out some time after the population census).
- In the census of agriculture and aquaculture, ask each household some screening questions to identify households that are involved in crop, livestock or aquacultural production activities. Use this information to identify all agricultural holdings and all aquacultural holdings.
- Enumerate all agricultural holdings and aquacultural holdings to collect the core data for the census of agriculture and aquaculture.

7.18. An important element in integrating the agricultural and aquacultural censuses is the use of common items, concepts and definitions for the two censuses. Minor changes are needed to make some items applicable to both agricultural holdings and aquacultural holdings. For example, the “agricultural holder” in Items 0003 and 0004 could be renamed the “holder”, to describe the main decision-maker for either an agricultural holding or an aquacultural holding. Also, Item 0006 (main purpose of production) would need to be amended for the aquacultural census to cover income from aquacultural production.

7.19. More substantial changes may be needed for Item 0007 (area of holding according to land use types) and Item 0008 (area of holding). Area of holding in an agricultural census excludes bodies of water used for aquaculture but not owned by the holding, such as seawater (see paragraph 11.44). This is of special interest in an aquacultural census, and the definition of area of holding should be modified for a census of agriculture and aquaculture. For the purposes of measuring area of holding in the census of agriculture and aquaculture, the area of a body of water should be defined as the surface area of the water body. Also, bodies of water should be separately identified under “Other land” in the land use classification.

7.20. It is recommended that one additional aquaculture-related item be included in the core module of the aquacultural census. This item is the same as supplementary Item 1001 (see paragraphs 11.297–11.300).

0017 AREA OF AQUACULTURE BY TYPE OF SITE (for the holding)

- Land-based
 - Arable land
 - Non-arable land
- Inland open water
- Coastal and sea water

Supplementary modules

7.21. Census supplementary modules for the census of agriculture and aquaculture should be based on frames provided by the core modules. The supplementary modules could be surveys of agricultural holdings, aquacultural holdings, or both agricultural holdings and aquacultural holdings. For example, an aquacultural module would be based on a frame of aquacultural holdings, whereas a household food security module might cover both agricultural holdings and aquacultural holdings.

7.22. The supplementary items listed in Chapter 4 should provide the basis for designing the supplementary modules for the census of agriculture and aquaculture. Aquacultural items should be the same as in a standard agricultural census, except for Item 1001, which is recommended for inclusion in the core module. For other supplementary items, the concepts and definitions depend on the scope of the supplementary module. For a module that covers specific agricultural holdings only, the concepts and definitions given in Chapter 11 would be applicable. However, for a module covering aquacultural holdings, some changes would be needed:

- Theme 01: Land. If the definition of area of holding is changed to include bodies of water, additional aquacultural parcels would need to be defined. Parcels could consist of bodies of water. Special procedures would be needed for Item 0101 (location of parcel) where a parcel is not located in an administrative division, but in the sea. Item 0105 (presence of shifting cultivation) and Item 0106 (years since land cleared) would not be applicable to parcels consisting of bodies of water.
- Theme 02: Irrigation and water management. In a standard agricultural census, the concept of irrigation refers to providing land with water to improve crop production. This concept may be widened to also include the provision of water for aquaculture.
- Theme 05: Agricultural practices. As it stands, this category of items refers only to practices used for crop and livestock production. This would need to be expanded to cover aquaculture. Item 0505 should include machinery and equipment used for aquacultural production. Some additional practices specific to aquaculture may also be included.

- Theme 06: Agricultural services. These items should also cover services for aquaculture. Items 0601–0604, relating to the use of credit facilities, should include credit for aquacultural purposes. Items 0605-0606, relating to sources of information and extension services, would also need to cover services for aquaculture.
- Theme 07: Farm labour. Item 0814, relating to work on the holding, should include work in connection with aquaculture. Items 0821 and 0822, relating to employees on the holding, should include labour used for aquacultural production. Item 0823, relating to contract work on the holding, should also include work for aquacultural production.

7.23. The need for data specific to agricultural holdings or to aquacultural holdings should also be considered in developing census supplementary modules. For example, in an agricultural/aquacultural practices module, separate data may be needed on machinery used for: (i) only agriculture; (ii) only aquaculture; and (iii) both agriculture and aquaculture. Questionnaires need to be carefully designed to ensure that those needs can be met.

7.24. The sub-holding and sub-holder concepts may also need to be reviewed for a census of agriculture and aquaculture. A sub-holding is normally defined on the basis of an own-account agricultural production activity managed by a particular person (see paragraph 3.44). This may need to be widened to cover both agricultural and aquacultural activities.

CHAPTER 8

COLLECTING ADDITIONAL AGRICULTURAL DATA FOR HOUSEHOLDS THAT ARE NOT AGRICULTURAL PRODUCERS

Chapters 1–7 focus on traditional agricultural censuses, covering economic units (agricultural holdings) engaged in crop and livestock production activities. Some countries might like to obtain additional agricultural data for other households, such as for households living in rural areas or households whose members are working in the agricultural industry. This chapter discusses issues to be considered by countries requiring such additional data from their agricultural censuses. The use of the population census or existing surveys as a possible source for these data is also examined.

Introduction

8.1. Agricultural censuses, as presented in earlier chapters, aim to measure the structure of crop and livestock production activities carried out by agricultural holdings. Some countries might like to use the agricultural census to also collect additional data on households that are not agricultural holdings.

8.2. Often, in an agricultural census, it is necessary to interview each household to identify agricultural holdings, before going on to collect the required agriculture-related data from each holding. This especially applies where the agricultural census frame is obtained from the population census household lists (see paragraph 3.59). Because all households need to be interviewed in any case, it can be cheap and easy to collect additional data for all households. Some countries might be interested in providing data specifically for households that are involved in agriculture in some way, such as households living in rural areas or households whose members are working in agriculture.

8.3. Agricultural censuses are normally concerned with aspects of agricultural production activities, such as farm size, crops grown, number of livestock, and use of farm machinery. These data are not relevant to households that are not agricultural holdings because such households do not grow crops or raise livestock. The main interest in these households would centre on socio-economic data, such as demographic and economic activity data. Such data are usually better obtained from a population census.

Use of a population census or survey to meet additional data needs

8.4. A population census provides a wide range of data on the characteristics of the population, such as sex, age, activity status, status in employment, occupation and industry. Sometimes, income data are also provided. The target group of interest for the additional data can also usually be identified. For example, a population census distinguishes between urban and rural households, which enables tabulations of population census data specific to rural households to be prepared. Occupation data from a population census can also be used to prepare tabulations specific to persons working in agriculture.

8.5. It is recommended that consideration first be given to meeting additional data needs of this type through the population census, rather than the agricultural census. As noted in Chapter 6, the agricultural census development team should work closely with the population census development team to coordinate the two activities and find the best way to satisfy data needs. Often, the additional data needs can be met directly from the population census; sometimes, minor changes can be made to the population census to meet the additional needs.

8.6. Sometimes, the additional data needs can be only partly met from the population census. For example, the population census may provide basic demographic and activity status data, but more detailed

data such as work in all jobs, type of agricultural work done, or time worked may be required. Data not normally covered in a population census, such as household food security or household income, may also be needed. Rather than collecting these data as part of a wider agricultural census, it is usually better to carry out a separate survey based on a sampling frame from the population census. Again, the need to coordinate work on the two census activities is paramount.

8.7. Often, other national household surveys can be used to meet the additional agricultural data needs. Many countries carry out regular employment and demographic surveys. The Living Standards Measurement Surveys (LSMS) often include an agricultural component. Using an existing survey to meet additional agricultural data needs is cheaper and also provides the opportunity for more analysis than from a standalone survey. For example, an LSMS provides a vast array of data on various social and economic topics, such as income and expenditure, which could be useful in analyzing the agricultural data.

8.8. Usually, countries are able to satisfy most additional agricultural data needs directly from the population census, from an existing survey, or through a special survey. Only rarely should there be a need to widen the agricultural census beyond the collection of data on agricultural production activities.

Scope of a widened agricultural census

8.9. The scope of a wider agricultural census depends on the data requirements. Some countries may wish to cover all households. More commonly, interest centres on households involved in agriculture in some way. This may be defined in various ways.

8.10. Some countries may wish to carry out a census of rural households. Rural households are defined in terms of households living in areas designated as rural areas, usually based on the population census. There are no standard criteria for classifying areas as urban or rural. Often, it is based on population density; for example, a rural community could be defined as one with population density less than 150 inhabitants/square kilometre. Sometimes, data on the percent of economically active population employed in agriculture can be used. Ideally, the urban/rural split is provided at the level of the smallest administrative unit of the country, such as the village (UN, 1998, pp. 2.52–2.59; UNECE et al., 2005, Chapter II.1). Note that a census of rural households, on its own, would not cover all agricultural holdings; some households living in urban areas have crop and livestock production activities.

8.11. Another type of wider agricultural census is one that covers all households containing at least one member employed in an agricultural occupation. This would include households with persons working on their own holding, as well as households with persons working as employees in agricultural jobs. Another option could be to cover all households whose main source of income is from agriculture.

8.12. Note that, in widening the agricultural census in this way, three types of statistical units would be covered: (i) agricultural holdings in the household sector; (ii) agricultural holdings in the non-household sector; and (iii) non-production households.

Analyzing household data for agricultural holdings and non-production households

8.13. To analyse a wider agricultural census, data from non-production households need to be combined with data from agricultural holdings in the household sector. To do this, a common statistical unit – the household – is needed.

8.14. The definition of an agricultural holding distinguishes between the economic unit of agricultural production and the household (see paragraphs 3.28–3.31). Many countries define the two units to be equivalent, which simplifies the analysis of a wider agricultural census. If the holding and household units are different, the two units need to be clearly distinguished in the data collection and analysis.

8.15. In terms of household data, a wider agricultural census includes two types of households: (i) households with own-account agricultural production (that is, households associated with holdings in the household sector); and non-production households. In a normal agricultural census, household data are often collected as part of the holding-level data. In a wider agricultural census, a different approach may be used; namely: (i) collect general household data for all households of the two types given above; and (ii) identify each agricultural holding and collect agricultural production related items for each holding. It may be necessary to use two questionnaires: one for all units in the household sector, and the other for holdings in the non-household sector.

Methodology and items for a wider agricultural census

8.16. A wider agricultural census should be carried out within the same modular framework as for a normal agricultural census.

Core module

8.17. Some core agricultural census items identified in Chapter 4 could also be applicable to non-production households; in particular, Item 0005: Household size; Item 0014: Presence of aquaculture; Item 0015: Presence of forest and other wooded land; and Item 0016: Other economic production activities.

8.18. Other household items could be included to meet data requirements. The number of items should be kept to a minimum, in keeping with the modular philosophy used for the agricultural census, and taking into account data already available from the population census and elsewhere. Note that any additional items required for non-production households also need to be collected for households with own-account agricultural production.

Supplementary modules

8.19. Census supplementary modules for a wider agricultural census would be carried out as per a normal agricultural census. The supplementary modules could be of two types.

8.20. First, there are the normal census supplementary modules based on agricultural holding frames. Items should be chosen from the list of items in Chapter 4. Concepts and definitions in Chapter 11 apply.

8.21. Second, there are modules based on a frame of non-production households and households with own-account agricultural production. These could cover supplementary themes shown in Chapter 4; in particular, Theme 07 (demographic and social characteristics); Theme 08 (farm labour); Theme 09 (household food security); Theme 10 (aquaculture); and Theme 11 (forestry). Modules on household food security module or farm labour could be particularly useful, given the wider coverage of households. Household supplementary modules could be conducted on other themes altogether.

Frame for a wider agricultural census

8.22. Various frame options are available. A frame of households or EAs from the population census is commonly used. If necessary, screening questions are asked in the agricultural census to identify the specific non-production households to be covered by the agricultural census. Depending on the content of the population census, it may be possible to construct a frame of agricultural holdings and non-production households directly from the population census. Alternatively, a farm register could be used in conjunction with a frame of non-production households from the population census.

CHAPTER 9

PROGRAMME OF AGRICULTURAL SURVEYS

WCA 2010 envisages the census of agriculture being the central component of the system of integrated agricultural censuses and surveys. Previous chapters have focused on the core and supplementary modules of the census of agriculture. This chapter presents a broad overview of the programme of agricultural surveys to be developed based on the census of agriculture. Some possible topics for the programme of agricultural surveys are identified and a brief description of the content of each survey is provided.

Introduction

9.1. Throughout this publication, emphasis has been given to the census of agriculture as a part of the system of integrated agricultural censuses and surveys. The census of agriculture provides structural data on agriculture, with the key data collected in the core module, and more detailed items collected in the sample-based supplementary module(s). Under the integrated system, a programme of agricultural surveys should also be carried out, based on the census of agriculture, to provide current operational and performance data required to complement the structural data from the census of agriculture. Previous chapters have focused on the census of agriculture; in this chapter, the programme of agricultural surveys is examined.

9.2. Agricultural censuses involve the collection of data from agricultural holdings, which can provide the basis for establishing sampling frames for agricultural sample surveys. For example, the agricultural census could provide a frame of holdings growing cassava for use in a cassava production survey, or a frame of holdings with pigs for a survey of pig breeding. In the context of the agricultural census, the programme of agricultural surveys refers to surveys of agricultural holdings based on the agricultural census. For more information on using the agricultural census to establish sampling frames for the programme of agricultural surveys, see paragraphs 10.16–10.37.

9.3. Other types of agriculture-related surveys, not based on the agricultural holding unit, are not considered in this chapter. Surveys on food consumption, income and expenditure, rural labour force, and household food security provide important agriculture-related data, but usually have a wider scope than just agricultural holdings. Often, they cover all rural households. Some agriculture-related surveys cover other types of units altogether – for example, a survey of agricultural service establishments – and these are also not discussed here.

9.4. The programme of agricultural surveys outlined in this chapter is wide-ranging, and includes periodic agricultural production surveys, as well as in-depth surveys such as cost of production and time use. It is not possible in this volume to give a detailed description of all possible agricultural surveys. Instead, the most important types of agricultural surveys are highlighted.

9.5. The intention is not to recommend the surveys each country should carry out. Each country has its own way of organizing the national survey programme for agricultural and other statistics. Most countries conduct periodic agricultural production surveys, but other agricultural surveys are conducted according to national priorities and data requirements, taking into consideration cost and other constraints. Countries are encouraged to plan the programme of agricultural surveys prior to the agricultural census, to ensure that the census is integrated into the agricultural statistics system and that the census meets the needs of the programme of agricultural surveys.

9.6. Some survey topics shown in this chapter are also given as themes for the census supplementary modules in Chapter 4. Here, the agricultural surveys provide current data or more in-depth data than is possible in a census supplementary module. For “livestock”, for example, the

agricultural census provides data on the structure and population dynamics of livestock herds, whereas the programme of agricultural surveys includes data on livestock production and sales, as well as detailed data on feed and livestock breeds. Other agricultural survey topics, such as “time use” and “cost of production”, are not covered by the agricultural census.

9.7. The boundary between a “census supplementary module” and an “agricultural survey” is often blurred. A country may not be able to do a particular census supplementary module in conjunction with the core census module, but may include the data from that module in a survey carried out some time after the agricultural census. Also, a survey done a few months after the agricultural census could be considered as a census supplementary module or part of the programme of agricultural surveys.

9.8. Data under the different headings are inter-related and a specific agricultural survey will normally collect a variety of data on related topics. For example, in an aquacultural survey, there would be interest in relating aquacultural data with data on land, crops and livestock, as well as studying labour inputs and other agricultural practices. Some issues, such as gender, are of interest to most surveys. Household food security elements may also be important for some surveys. Sometimes, a particular survey topic can be attached to an existing survey; for example, a survey of post-harvest losses could be undertaken as a supplement to an annual production survey every few years.

Inter-censal structural survey

9.9. Agricultural censuses are normally carried out every ten years, covering those aspects of agriculture that change slowly over time: the so-called “structural” data. Countries undergoing rapid agricultural development may find that structural changes happen quickly, and structural data may be needed more frequently than every ten years.

9.10. Some countries may wish to conduct an agricultural census every five years, based on the modular approach described in this publication. Sometimes, a “mini-census” is conducted in the middle of the decennial inter-censal period to provide certain key structural data. A modular approach could be used: for example, if cropping patterns were changing rapidly, the core module of the mini-census could focus on land use and crops, with sample-based supplementary modules on crops and agricultural practices undertaken to provide more detailed data.

9.11. Usually, countries do not have enough resources for a five-yearly agricultural census, and need to collect additional structural data between censuses through sample surveys. The type of data collected in an inter-censal structural survey depends on the nature of agricultural development in the country. For example, if the livestock industry was developing rapidly, the inter-censal structural survey could repeat the census supplementary module on livestock. Elements from other modules related to livestock, such as household food security and farm labour, could also be included. Sometimes, the main interest in an inter-censal structural survey is on changes for particular crop or livestock types, and the inter-censal survey could focus on those.

Crops

9.12. The agricultural census provides data on the presence of each temporary and permanent crop (core module), and the area and production of each crop, use of fertilizer, and source and type of seed inputs (supplementary module). A variety of crop surveys are usually needed to complement these data.

9.13. The key requirement is for annual or seasonal data on the production of major crops. This could require a single crop production survey or, more commonly, a series of surveys. For example, a country may need to carry out a semi-annual rice production survey, as well as annual cassava and coffee production surveys, with each survey timed to coincide with the crop harvest. A particular crop production survey could have several elements: for example, an interview with producers to collect information such as area planted, varieties used and inputs, and a crop-cutting component to estimate the yield based on sample plots.

9.14. Crop production surveys may be a part of a comprehensive crop forecasting system. This could involve, for example: (i) a survey of planting intentions conducted just before planting; (ii) a survey of crop plantings taken just after planting is finished; (iii) a survey of crop conditions carried out sometime before the harvest, and (iv) a crop production survey undertaken after the harvest.

9.15. Other types of crop surveys, based on agricultural holdings, may be required from time to time:

- Survey of post-harvest losses. A survey of post-harvest losses for rice producers, for example, measures the losses during harvesting, on-farm processing, transportation and storage. Such surveys are important to measure the effect of post-harvest losses on food supplies.
- Survey of farm food stocks. This looks at the quantity of, for example, maize held in stock by maize producers, and is important for assessing household food security in countries where farmers produce mainly for their own consumption.
- Survey of crop marketing. A survey of wheat producers, for example, could be run to understand how farmers market their surpluses.
- Special survey of a specific crop. An in-depth survey of, for example, fruit growers could highlight the problems faced in further developing the fruit production industry.

Livestock

9.16. In the agricultural census, the core module provides data on the number of animals by livestock type, while the livestock supplementary module includes data on the structure of livestock herds (age, sex and purpose), livestock population dynamics (births, deaths, etc.), and types of feed.

9.17. The key requirement for additional livestock data is for periodic livestock production surveys. Usually, a series of specific surveys is needed. For example, quarterly surveys of holdings with cattle may provide data on cow milk production, while annual surveys of holdings with sheep may provide data on wool production. Often, data from these surveys are supplemented by information from other sources – such as livestock marketing boards, or surveys of abattoirs, meat packing plants, butchers or dairies – to provide a comprehensive picture of livestock production.

9.18. Regular surveys may be needed for feed statistics to measure the quantity and composition of feed for different livestock types, and the seasonality of feed availability. Surveys can also be used to estimate the production of fodder crops, often using crop cutting experiments to measure nutritive values. Data on stocking rates are also often collected as a way of assessing fodder utilization.

9.19. Other types of in-depth surveys of livestock include: surveys on the structure of livestock herds, especially specific breeds of animals; and surveys of the value of sales for each type of livestock product.

Aquaculture

9.20. In the agricultural census, data are limited to aquacultural activities carried out in association with agriculture. If aquaculture is important in a country, an aquacultural census should be undertaken in conjunction with the agricultural census, to provide structural data on the type of production facility, type of water, sources of water, type of organism, and aquacultural machinery (see Chapter 7). This can provide the basis for further aquacultural surveys.

9.21. Periodic surveys of aquacultural producers may be needed to provide aquacultural production data. An in-depth aquacultural survey could also be conducted to further explore the topics covered in the aquacultural census. Items collected could include:

- specific species of aquatic organisms cultivated;
- identification of pens, cages, hapas and floating rafts, and measurement of the number of units, area and depth;

- more information on tanks and raceways, including the number of units and the volume of water;
- seed and juvenile production of the aquatic organisms;
- type and source of aquafeeds, use of fertilizers, and use of biocides;
- cost of production of aquacultural products;
- more information on the integration between agriculture and aquaculture, such as sharing inputs and the use of agricultural products as inputs to aquaculture.

Farm management and cost of production

9.22. Farm management surveys provide detailed data on all aspects of decision-making on holdings. Data related to investments, assets, organizational structure and allocation of resources are usually collected. Farm management surveys are often carried out in conjunction with cost of production surveys.

9.23. Cost of production surveys measure the cost structures of specific agricultural activities, and provide key data for compiling the production accounts for agriculture and for assessing the competitiveness of particular agricultural industries. Cost of production surveys are usually specific to particular agricultural activities, such as tobacco production or goat meat production. Costs of production include operational costs – such as inputs, fuel, transport, interest, taxes and labour – as well as fixed costs such as land and equipment.

Time use

9.24. Time use surveys provide information on how people spend their time. Time use data show the time spent on different types of activities, such as working, education, home-making and recreation. Time use surveys have many uses, including assessing paid and unpaid work and analysing social issues.

9.25. Time use surveys normally have a full national coverage, but a time use survey specific to agricultural holdings could be useful in countries where it is difficult to measure the contribution of household members to work on the holding. A time use survey could collect data on the time spent by each household member on activities such as: land preparation; planting, maintaining or harvesting crops; post-harvest crop activities; feeding animals; and providing support services to agricultural workers. This would be especially useful for measuring the role of women in agriculture.

CHAPTER 10

SAMPLING FRAMES FOR AGRICULTURAL CENSUSES AND SURVEYS

One of the important aims of the census of agriculture is to provide a sampling frame for the agricultural survey programme. This chapter explains what a sampling frame is, and how a census can be used to create a sampling frame. It also discusses the use of population and agricultural censuses to create sampling frames for the agricultural census supplementary modules and the programme of agricultural surveys. Both single-stage and multi-stage sampling frames are considered, and the problems of keeping sampling frames up-to-date are highlighted.

What is a sampling frame?

10.1. In a census, each unit (such as person, household or holding) is enumerated, whereas in a sample survey, only a sample of units is enumerated and information provided by the sample is used to make estimates relating to all units. In an agricultural production sample survey, for example, a sample of agricultural holdings is enumerated, and information from the sample holdings is used to make estimates of total agricultural production.

10.2. In a sample survey, the sample of units to be enumerated must be selected using strict statistical procedures. A method known as random sampling is used. Random sampling is the process of selecting units for inclusion in the sample in such a way that each unit has a known, though not necessarily the same, chance (or probability) of selection. The simplest type of random sample is one selected by “lottery”, where all units have the same chance of selection in the sample; for example, in an agricultural survey, each agricultural holding would have the same chance of selection. Usually, sampling schemes are more complex than this, with units having differing probabilities of selection in the sample. In an agricultural survey, for example, large holdings may be given more chance of selection than small holdings; some very large holdings may even be completely enumerated.

10.3. To select a random sample for a sample survey, one needs, first, to clearly define which units are within the scope of the survey. Some specific surveys and the in-scope units are:

- National agricultural survey: all agricultural holdings in the country.
- Agricultural survey in Province A: all agricultural holdings in Province A.
- National rice production survey: all rice producers in the country.
- National aquacultural production survey: all aquacultural producers in the country.

10.4. Having determined the scope of the survey, a means of identifying all the in-scope units is needed, so that each unit can be given the required chance of selection in the sample. This is called a sampling frame. A sampling frame could be a list of units (such as households or holdings), areas (such as EAs), or any other materials (such as maps), and may also include information about each unit, such as their size, to help with the sample selection or survey estimation (FAO, 1989, pp 32–41; UN, 1986).

10.5. The best type of sampling frame is a list of all units within the scope of the survey. For example, for a national agricultural survey, the sampling frame would be a list of all agricultural holdings in the country. Here, the sample of holdings would be selected directly from this list, by giving each holding on the list the appropriate chance of selection in the sample. The sampling frame must provide a complete and up-to-date list of holdings, without omissions or duplications, and without including any units other than holdings. Holdings missing from the frame would have no chance of selection in the sample, while duplicate holdings would have more chance of selection than they should. In these circumstances, the sample would no longer be a random sample, which would bias the survey results.

10.6. Often, a list of units within the scope of the survey is not available. For example, an agricultural census identifies all agricultural holdings at the time of the census, but this would not provide an accurate list of holdings for a survey conducted some time after the census. Lists of households or agricultural holdings from a census quickly become out-of-date because:

- New households are created.
- Households cease to exist because people die or because of changes in family circumstances.
- Households move from one place to another.
- New agricultural holdings are created as households become agricultural producers.
- Agricultural holdings cease to exist as households stop being agricultural producers.
- The management structure of an agricultural holding changes, with the result that the holding is split into two, or combined with another holding.

10.7. Often, updating lists of households or agricultural holdings from a population or agricultural census for sampling frame purposes is too difficult or expensive. Instead, a sampling technique known as multi-stage sampling is used. In multi-stage sampling, random sampling is carried out in stages, as opposed to single-stage sampling where the sample is selected directly from lists of households or holdings. Thus, for an agricultural survey, a sample of EAs could be selected first, and then a sample of agricultural holdings selected in each sample EA. In multi-stage sampling, sampling frames are needed for each stage of sampling: in the example above, a list of all EAs in the country to select the sample of EAs, and lists of agricultural holdings in each sample EA to select the sample of holdings.

10.8. Multi-stage sampling is widely used for agricultural surveys, especially for the household sector. Its main advantage is that it is cheaper and easier to create lists of holdings just in the selected areas, rather than for the whole country. Data collection is also cheaper because the sample holdings are concentrated in the selected areas, rather being spread around the whole country. However, sampling errors are higher because of the “clustering” of sample in selected areas. Sometimes, multi-stage sampling is used in conjunction with single-stage sampling (see paragraphs 10.25–10.27).

10.9. Note that, for an agricultural survey, it is not necessary to have any information about agriculture on the sampling frame. A sampling frame of households, rather than agricultural holdings, is often used for the household sector as part of a multi-stage sampling scheme. Often the population census, rather than the agricultural census, is used for this purpose (see paragraphs 10.31–10.33).

10.10. Another type of sampling frame often used in agricultural surveys is an area sample frame. In area sampling, the unit being sampled is a physical piece of land, called a segment. A sample of segments is selected and data are collected in respect of the agricultural activities of each sample segment. Here, the sampling frame consists of all the segments making up the whole area within the scope of the survey. For example, for an agricultural survey in Province A, the sampling frame could be a map of Province A divided into clearly defined segments.

10.11. A variety of sampling techniques – such as stratification, systematic sampling, and probability proportional to size sampling – can be used to improve the efficiency of the sample design. Techniques such as ratio and regression estimation may also be used to improve the reliability of survey data. A description of these techniques is outside the scope of this publication.

Sampling frames for census supplementary modules

10.12. In the agricultural census, the supplementary modules are undertaken at the same time as, or soon after, the core module. Thus, the core module provides up-to-date lists of holdings for use as sampling frames for the supplementary modules. Examples of supplementary modules and the relevant sampling frames from the core module are:

- Crop supplementary module: list of agricultural holdings with temporary crops in Item 0011 or permanent crops in Item 0012.

- Livestock supplementary module: list of agricultural holdings with livestock in Item 0013.
- Agricultural practices module: list of all agricultural holdings.

10.13. One way to carry out a supplementary module based on the core census module is to use single-stage sampling. For example, a livestock module could be carried out as follows:

- Conduct the core census module by enumerating all holdings.
- During the core census enumeration, identify all holdings with livestock, to be used as a sampling frame for the livestock module.
- Select a sample of holdings with livestock based on this sampling frame, in accordance with the required sampling scheme, and enumerate those holdings for the livestock module.

10.14. This method may be difficult to implement for a supplementary module carried out at the same time as the core module, because enumerators would need to do the sample selection in the field. A multi-stage sampling approach is more commonly used as follows:

- Divide the country into EAs for the purpose of organizing the enumeration of the core census module.
- Prior to the census enumeration, select a sample of EAs for the livestock module.
- Conduct the core census module by enumerating all holdings in all EAs.
- During the core census enumeration, identify all holdings with livestock in the sample EAs. Special holdings with livestock, such as large units, would also be identified in the non-sample EAs.
- For the livestock module, enumerate all holdings with livestock in the sample EAs and all special holdings with livestock in the non-sample EAs.

10.15. The advantage of the multi-stage approach is that the sample selection of EAs can be done by technical staff prior to the fieldwork, rather than requiring each enumerator to do the sample selection. This makes the census field operations easier. A convenient way to organize the census enumeration would be to assign the best enumerators to the sample EAs, to interview each holding for the core module, and, if the holding is within the scope of the supplementary module, ask further questions for the supplementary module. All other enumerators would be assigned to the non-sample EAs to collect core data only. Senior field staff could enumerate the special holdings.

Sampling frames for the programme of agricultural surveys

10.16. Some examples of agricultural surveys and the applicable sampling frames from the core census module are shown below:

- Rice production survey: list of holdings growing rice in Item 0011.
- Pig production survey: list of holdings with pigs in Item 0013.
- Gender survey: list of holdings with sex of agricultural holder as female in Item 0003.
- Survey of young farmers: list of holdings with age of holder less than 25 years in Item 0004.

10.17. From a sampling point of view, an agricultural survey is like a census supplementary module, except that it is not carried out as part of the agricultural census, but some time later. This has implications for the sampling methodology. For example, a list of holdings with pigs from the core census module would not be accurate for a pig production survey conducted some years after the agricultural census. Even a gap of several months could result in serious shortcomings in the sampling frame.

10.18. Where a list of in-scope units from the core census module is deemed to be acceptable as a sampling frame for an agricultural survey, the frame can be established in a similar way to that for a census supplementary module, using either single-stage sampling (see paragraph 10.13) or multi-stage sampling (see paragraph 10.14). The single-stage approach is usually better suited to an agricultural

survey than a census supplementary survey, because the survey is carried out some time after the agricultural census, and sample selection can be done by technical staff prior to the survey, rather than by the enumerators as in a census supplementary module. However, the multi-stage approach is often still preferred because the “clustering” of sample reduces data collection costs (see paragraph 10.8).

10.19. Where a list of in-scope units from the core census module is not accurate enough to be used as a sampling frame for the agricultural survey, a different sampling approach is needed. Some alternatives are discussed below.

(a) Update the sampling frame of in-scope units: single-stage sampling

10.20. The best approach is to maintain an up-to-date list of agricultural holdings to provide a sampling frame for agricultural surveys undertaken at any time. Some countries maintain a register of holdings, containing basic information about each holding such as main agricultural activity and size. If specific crop production surveys are required, information about specific crops grown would also need to be provided on the register.

10.21. Keeping registers of holdings up-to-date is difficult and expensive. Often, it can be done by making use of information from government regulatory agencies, producers’ associations, telephone directories, or other administrative sources. Sometimes, the results of surveys and other statistical activities can be used to update the register. Many countries are unable to make available the necessary resources to do this work.

(b) Multi-stage sampling

10.22. Even if the list of holdings from the agricultural census core module is not good enough to directly select the sample for the agricultural survey, the core census data can still be useful for the sample design and fieldwork in a multi-stage sample design. A common sampling method, using a wheat production survey as an example, is given below:

- Select a sample of agricultural census EAs, using sampling techniques such as stratification and probability proportional to size sampling, based on wheat data from the core census module. A typical design would sample important wheat growing areas more heavily than other areas.
- Prepare a list of wheat producers in each sample EA, by updating lists of units available from the agricultural census core module.
- Select a sample of wheat producers in each sample EA, and enumerate those units for the survey.

10.23. Multi-stage surveys may not be efficient for agricultural surveys because they do not allow large holdings to be sampled more heavily than small holdings. This is of particular concern where there are a few dominant holdings, especially in the non-household sector. For this reason, a combination of single- and multi-stage sampling is preferred for agricultural surveys (see paragraph 10.25–10.27).

10.24. Another problem with multi-stage surveys of this type is that there can be changes in the administrative structure on which the EAs are based. Low-level administrative units such as communes and villages may change frequently, and this makes it difficult for enumerators to identify EAs in a survey conducted some years after the agricultural census. Special field procedures are needed to deal with this problem.

(c) Combination of single- and multi-stage sampling

10.25. Another approach is to use a combination of single- and multi-stage sampling. One way to do this is to create an up-to-date list of holdings for certain types of holdings only, with single-stage sampling used for those units and multi-stage sampling used for all other units.

10.26. For agricultural surveys, single-stage sampling is often used for the non-household sector or for large or otherwise important units, using a sampling frame of agricultural holdings obtained from the

agricultural census and updated using business registration records. Multi-stage sampling is then used to cover the household sector.

10.27. Another way is to use a list of holdings from the agricultural census as a sampling frame for those units present at the time of the census, with a small supplementary multi-stage sample used for other units.

Special sampling frame situations for agricultural surveys

(a) Periodic surveys

10.28. Some agricultural surveys are conducted on a regular basis; for example, a cassava production survey may be needed once a year to measure annual cassava production. For such surveys, the sampling frame must be updated each time the survey is run. Where multi-stage sampling is used, the list of units – for example, cassava production holdings – in each sample area must be updated for each round of the survey.

(b) Longitudinal surveys

10.29. A longitudinal survey is a special type of periodic survey aimed at studying changes in the behaviour of a particular group over time; for example, to assess how a group of maize farmers change their farming practices over time. Unlike normal ongoing surveys, longitudinal surveys are not designed to provide aggregated data, such as national maize production. In a longitudinal survey, the sample of units is selected at the start of the study and those units are followed up in each round of the survey. Longitudinal surveys only need a sampling frame at the beginning of the study. An agricultural census provides an ideal frame for a longitudinal study beginning soon after the census.

(c) Census supplementary modules as sampling frames for agricultural surveys

10.30. Usually, the sampling frame for an agricultural survey is obtained from the core module of the agricultural census. However, a supplementary module can also provide a good sampling frame, as shown in the following example for a survey of organic farmers.

- Conduct the agricultural census core module as normal.
- As part of the agricultural census, carry out a census supplementary module on agricultural practices, based on the sampling frame of agricultural holdings from the core module.
- Form a list of organic farmers from the agricultural practices module, and use this as a frame to select the sample of organic farmers for the survey of organic farming. This frame would need to be updated if the survey is conducted some time after the agricultural census.

(d) Use of the population census as a household sampling frame for agricultural surveys

10.31. As noted in paragraph 10.9, a household sampling frame from the population census can be used to select the sample for the household sector of an agricultural survey. Non-household units would be covered by a separate sampling frame. A common household sampling method is:

- Select a sample of population census EAs.
- In each sample EA, form a list of population census households, updated as necessary if the survey is conducted some time after the population census. Select a sample of households in each sample EA, based on these household lists.
- Interview each sample household to ask screening questions to find out if the household contains an agricultural holding within the scope of the survey.
- Enumerate each holding identified in this way to collect data for the survey.

10.32. A population census sometimes provides a better sampling frame than an agricultural census, because it covers all households in the country, rather than just agricultural holdings. It can therefore be

used as a sampling frame for agricultural surveys with a wider coverage than agricultural holdings. For example, a household food security survey usually covers all rural households or even all households in the country. Also, a farm labour survey should cover not only agricultural holdings, but also other households with members working in agriculture.

10.33. Sampling error issues need to be considered when using the population census as a frame for agricultural surveys. The smaller the proportion of households covered by the survey, the higher will be the sampling errors. Thus, the household sampling approach might be suitable for a chicken production survey, but would be less satisfactory for a goose production survey.

(e) Master sampling frames

10.34. A master sampling frame is a general purpose sampling frame created from a census, for use in selecting samples for different surveys or different rounds of a periodic survey. The frame is usually maintained by the national statistical office, and is updated on an ongoing basis so that it is available for any survey carried out at any time.

10.35. A master sampling frame has several benefits. It is quick and easy to conduct surveys of any kind, because a ready-made frame is already available. The cost of preparing sampling materials and selecting samples is also reduced. Master sampling frames also make it easier to relate data from different surveys and to control the reporting burden on survey respondents.

10.36. Master sampling frames suitable for agricultural surveys may be available from either the population census or the agricultural census.

- Population census. The population census master sampling frame is a database of small geographical units, such as villages or EAs, containing key data about each unit, such as the population and the number of households. This can be used to select samples for any type of household survey, including agricultural surveys (see paragraphs 10.31–10.33). A supplementary frame may be needed for non-household holdings and any other large holdings.
- Agricultural census. Agricultural census master sampling frames are of two types. One type is similar to a population census master sampling frame in that it is a database of small geographical units, such as villages or EAs, containing key agricultural data about each unit, such as the area of major crops and the number of livestock. Another type of agricultural census master sampling frame is a database of agricultural holdings, created and maintained following an agricultural census, containing key agricultural data about each holding, such as the crops grown and the livestock raised. Often, the master sampling frame is a combination of the two frame types, with a database of all important agricultural holdings complementing the EA frame. A master sampling frame from an agricultural census can be used for any type of survey of agricultural holdings.

10.37. A similar form of sampling frame is a register of businesses, containing information such as management structure, industry, employment, and turnover for each business unit. This can be used as a sampling frame for any economic survey. Usually, such frames include agriculture, sometimes for the non-household sector only, and can also be used for agricultural surveys.

Sampling frames for a sample-based agricultural census core module

10.38. So far, this chapter has looked at sampling frames from the agricultural census in situations where the core census module is based on a complete enumeration of agricultural holdings. This section considers sampling frame issues where the core module is carried out on a sample basis.

10.39. In a sample-based core census module, a sampling frame is needed for the core module itself. For the household sector, this is normally based on the population census. The sampling methods are similar to those for any other agricultural survey. Sometimes, the population census provides information on

households engaged in own-account agricultural production for use in the sample design and selection for the core module. For the non-household sector, a frame from administrative sources is often used.

10.40. A sample-based core census module can still provide a sampling frame for the census supplementary modules and the programme of agricultural surveys, even though the core module itself is only a sample of agricultural holdings. This can be done by sub-sampling core module holdings. This is illustrated in Figure 10.1, using an aquacultural supplementary module as an example.

10.41. The main proviso in the use of a sample-based core census module as a sampling frame for the census supplementary modules is that the core census sample must be big enough to provide sufficient sample for the supplementary modules. Thus, a sample of 100,000 holdings for the core census module might yield 10,000 holdings with aquaculture, more than sufficient for an aquacultural module. However, it might yield only 50 holdings growing potatoes, which would be insufficient for an in-depth potato survey. Countries should plan their agricultural census and survey programme at the outset to ensure that data requirements can be met.

Figure 10.1: Household sampling frames from complete and sample enumeration core modules

Step	Complete enumeration core module	Sample core module
1. Core census module frame	List all households by EA from the population census.	List all households by EA from the population census.
2. Core census module enumeration	Enumerate all households in all EAs to identify agricultural holdings; do core census module for all agricultural holdings.	Select a sample of EAs and then a sample of households in selected EAs; enumerate sample households to identify agricultural holdings; do core census module for sample holdings.
3. Frame for aquacultural supplementary module	List all holdings in the country with aquaculture, based on the core census module.	List holdings with aquaculture as enumerated in the sample core census module.
4. Sample for aquacultural module	Select a sample of holdings with aquaculture from the aquacultural frame.	Select a sample of holdings with aquaculture from the aquacultural frame (sub-sample of core module holdings).

PART TWO

AGRICULTURAL CENSUS ITEMS – CONCEPTS, DEFINITIONS AND TABULATIONS

CHAPTER 11

CONCEPTS AND DEFINITIONS OF AGRICULTURAL CENSUS ITEMS

This chapter contains a description of the concepts and definitions for the agricultural census core and supplementary items given in Chapter 4. The concepts and definitions have been developed taking into consideration international standards and the need for comparability with previous agricultural censuses and with other data sources. Any major changes from previous programmes are highlighted. Countries will need to adapt the concepts and definitions given to meet their own needs and circumstances.

Introduction

11.1. This chapter provides recommended concepts and definitions for the agricultural census core and supplementary items shown in Chapter 4. The concepts and definitions are based on international standards, where applicable, to ensure that agricultural census results are comparable with other data sources. Where items were included in earlier agricultural census programmes, the concepts and definitions are generally the same as those used previously. Explanations are provided, as needed, to help make comparisons with previous agricultural census data.

11.2. In an integrated agricultural statistics system, the need for uniformity in concepts and definitions between the agricultural census and other agricultural statistics is also important. Often, there are well-established standards for current agricultural statistics; for example, many countries already have standards for reporting on crops or seasons, which should be consistent with the agricultural census.

11.3. It is recognized that countries will need to adapt the standards given in this chapter to meet their needs and circumstances, but this should be done in such a way that the census data are compatible with international standards. Where it is necessary to depart from these standards, the differences should be highlighted in the presentation of the census results, and explanations given as to how the national data can be compared with those from other countries.

General core items

0001 IDENTIFICATION AND LOCATION OF AGRICULTURAL HOLDING

11.4. The location of the agricultural holding is needed to assign agricultural holdings to administrative units or agro-ecological zones, which are key classification items in the tabulation of agricultural census results. Usually, the location of a holding is identified by where the farm buildings and agricultural machinery are located. Care is needed if the holding comprises two or more parcels. Sometimes, the location of each parcel is also identified (see paragraph 11.55). Often, the holder's residence is used as the holding location.

11.5. Location is normally identified through a geographic coding system, based on the administrative structure of the country. Codes are provided for each administrative unit such as province, district and village. This identifies the location of the holding down to the lowest administrative unit. Where a standard national geographic coding system exists, it should be used for the agricultural census to make it easier to link data between the different sources.

11.6. Other types of geo-coding systems can also be used. It is now possible to geo-reference holdings with the use of Global Positioning Systems, and countries are encouraged to move in this direction. This can help in the presentation of census results through Geographic Information Systems and to link data to other sources.

0002 LEGAL STATUS OF AGRICULTURAL HOLDER

- An individual
- Two or more individuals
- Juridical person

Holders may also be classified into the following sectors:

- *Household sector*
 - *Single-holding household*
 - *Multiple-holding household*
 - *Partnership of two or more households*
- *Non-household sector*
 - *Corporation*
 - *Cooperative*
 - *Government*
 - *Other*

11.7. Item 0002 is about the legal status of the agricultural holder¹. Legal status refers to the juridical aspects under which the agricultural holding is operated. It also refers to other aspects about the type of holding. From the juridical point of view, a holding may be operated by a single individual, jointly by several individuals with or without contractual agreement belonging to the same or to different households, or by a juridical person: corporation, cooperative, governmental institution, church, etc. Legal status of holder is an important classification item especially in combination with the sector where the holder belongs (see paragraph 11.8)., This item can also be useful for sampling frame purposes.

11.8. The sector where the holder belongs may be classified as “household sector” and “non-household sector”. Countries are encouraged to distinguish between these two sectors in the census tabulation. Holdings in the household sector are holdings that are operated by household members. Usually there is only one holding in a household (single-holding household), but there can be two or more holdings in a household (multiple-holding household). A holding may also consist of a partnership of two or more households. In many developing countries, most agricultural holdings are in the household sector.

11.9. Non-household holdings are those in sectors other than the household sector. Corporations and cooperatives are defined within the context of national laws and customs. Cooperatives include several kinds of organizations in which the principles of individual, joint ownership or leasehold are combined to various degrees. The other sector includes tribes, clans, private schools and religious institutions. Government holdings are agricultural production entities operated by a central or local government directly or through a special body.

11.10. The reference period is the day of enumeration.

0003 SEX OF AGRICULTURAL HOLDER

- *Male*
- *Female*

11.11. Item 0003 is important for analyzing the gender aspects of agricultural production and, in particular, to examine the role of women in managing agricultural holdings. This item could also be useful as the basis for a sampling frame for special gender surveys.

11.12. Data on sex of agricultural holder is collected only for holdings in sector “single-holding household” in Item 0002. Data usually refer to the day of enumeration. Where there are two or more

¹ See definition of agricultural holder - paragraphs 3.36-3.41

co-holders in a holding, the sex of each person should be reported. For the definition of an agricultural holder, see paragraphs 3.36–3.41. See Figure 12.1 for information on how to tabulate sex of holder data.

11.13. It is not expected that the core census module will include the collection of demographic data for each person in the household, and therefore it would be necessary to collect data on the sex (and age) of the holder directly from the respondent. Where demographic data are collected, sex of holder can be determined by identifying the holder and linking this to the personal data (Item 0711).

0004 AGE OF AGRICULTURAL HOLDER

11.14. Age of holder is important for studying the relationship between age and the characteristics of agricultural holdings and, in particular, to compare young and old farmers. It is also useful for analyzing gender issues.

11.15. Age refers to the age in completed years at the time of the census. The item is collected only for holdings in sector “single-holding household” in Item 0002. Where there are two or more co-holders in a holding, the age of each person should be reported. See Figure 12.1 for information on how to tabulate age of holder data.

11.16. For the definition of an agricultural holder, see paragraphs 3.36–3.41. For information on data collection issues, see paragraph 11.13 and paragraph 11.217.

0016 OTHER ECONOMIC PRODUCTION ACTIVITIES OF THE HOLDING'S ENTERPRISE

- *Other agricultural production*
- *Agricultural services*
- *Hunting, trapping, game propagation and related service activities*
- *Forestry, logging and related service activities*
- *Fishing, aquaculture and related service activities*
- *Manufacturing*
- *Wholesale and retail trade*
- *Hotels and restaurants*
- *Other*

11.17. By definition, an agricultural holding consists of the agricultural production activities of an enterprise, where an enterprise is a corporation, a government institution, or (most commonly) a household. An enterprise containing an agricultural holding may be engaged in production activities other than agricultural production. For example, a household may operate a shop or restaurant, in addition to operating the agricultural holding. Item 0016 is included in the core census module to understand the relationship between agricultural production activities and other economic production activities.

11.18. Other economic production activities are economic production activities undertaken by the enterprise, other than agricultural production on the holding. This may include fishing, collecting forestry products, craft activities, and operating a family business. It does not include paid work as an employee. Normally, the reference period is the census reference year.

11.19. Nine activity categories are shown, based on ISIC (Rev. 3.1) (UN, 2004b):

- Other agricultural production refers to agricultural production activities of the enterprise outside the holding, such as where there are two holdings in a household.
- Agricultural services cover agricultural production related work done under contract on other holdings.
- Hunting, trapping, game propagation and related service activities include hunting for food, fur and skin.

- Forestry, logging and related service activities include growing of standing timber, logging, gathering of wild forest materials, and forest management services. These activities may be undertaken on land forming part of the holding or elsewhere.
- Fishing, aquaculture and related service activities cover commercial fishing and related activities, including aquaculture. These activities may be carried out on land forming part of the holding or elsewhere. Note that this activity class covers all aquacultural activities of the enterprise, whereas Item 0014 only covers aquaculture carried out in association with agricultural production.
- Manufacturing includes a whole range of activities associated with transforming raw materials into new products. For households, the most common manufacturing activities are food processing, making clothes and other textile materials, tanning, and making wood products.
- Wholesale and retail trade covers services associated with the sale of goods at the final stages of distribution, such as through a market or shop.
- Hotels and restaurants covers all accommodation and food services.
- Other covers all other economic production activities, including activities related to construction and transportation.

Theme 01: Land

Core items

0007 AREA OF HOLDING ACCORDING TO LAND USE TYPES

11.20. Land use refers to activities – such as growing crops, raising livestock or cultivating fish – carried out on the land making up the holding with the intention of obtaining products and/or benefits. Land use should be distinguished from “land cover”, which describes the physical characteristics of the land, such as grassland or forest. In the agricultural census, the area of the holding is classified according to its main land use. See paragraphs 11.40–11.45 for more information on area of holding.

11.21. There is no universally accepted standard land use classification. For the purposes of the agricultural census, it is recommended that seven basic land use classes be identified:

- land under temporary crops;
- land under temporary meadows;
- land temporarily fallow;
- land under permanent crops;
- permanent meadows and pastures;
- forest or other wooded land;
- other land.

11.22. Definitions of these land use classes are given in paragraphs 11.27–11.37. For presenting agricultural census results, the seven land use classes need to be grouped in a suitable way. There are many ways to do this, using terms such as agricultural land, cultivated land, cropland and arable land. There are no standard definitions for many of these terms. For example, some countries define arable land as land that is potentially cultivable, whereas other countries consider it to be land under temporary crops or meadows. FAO recommends the land use classification shown in Figure 11.1.

Figure 11.1: Classification of land use

I	II	III	IV
Agricultural land	Cropland	Arable land	Land under temporary crops
			Land under temporary meadows
			Land temporarily fallow
	Permanent meadows and pastures	Land under permanent crops	
Forest or other wooded land			
Other land			

11.23. This classification is a condensed version of the one used in earlier agricultural census programmes. The main differences from the 2000 programme are:

- The concept of “productive land” is no longer used. Countries wishing to continue to use this concept should define productive land as the sum of “agricultural land” and “forest or other wooded land”.
- The concept of “cultivated land” is no longer used. This is equivalent to “cropland” under the recommended classification.
- The category “land under protective cover” is no longer used in the classification. Land previously shown in this category is included under “arable land” or “land under permanent crops”. Data on land under protective cover are recommended for inclusion in the sample component of the agricultural census as Item 0327.
- “Other arable land” is included under “land temporarily fallow”.
- “Permanent meadows and pastures” is not further sub-divided by whether it is cultivated or naturally grown.
- “Other land” is not further sub-divided according to its potential for development.

11.24. A country may prefer to use its own land use classes and classification because they are well-established and meet national needs. Countries doing so should ensure that the land use classes can be aggregated up to the seven basic land use types. Land use data should also be presented according to the FAO recommendations to enable international comparisons to be made.

11.25. Land use data are often collected at the parcel level. A parcel may have more than one land use and, normally, provision is made in the questionnaire for the area of the parcel to be split into more than one land use type. For example, if some fields in a parcel are used for growing temporary crops and others are fallow, the area of temporary crops and fallow land are recorded accordingly.

11.26. Sometimes, there is a mixture of land uses in a parcel or field that cannot be subdivided – for example, where permanent and temporary crops are grown together as associated crops (see paragraph 11.109), or where the same land is used for aquaculture in one season and for growing rice in another season. In such cases, land use should be determined on the basis of its main use. Main use is normally defined on the basis of the value of production from each activity, such as for associated permanent/temporary crops, aquaculture/agriculture, or agriculture/forestry combinations. Where agriculture, aquaculture or forestry activities are carried out on the same land as other activities, the activities related to agriculture, aquaculture or forestry normally take precedence in determining land use.

11.27. Land under temporary crops includes all land used for crops with a less than one year growing cycle; that is, they must be newly sown or planted for further production after the harvest. Some crops

that remain in the field for more than one year may also be considered as temporary crops. Asparagus, strawberries, pineapples, bananas and sugar cane, for example, are grown as annual crops in some areas. Such crops should be classified as temporary or permanent according to the custom in the country.

11.28. The area of land under temporary crops refers to the physical areas of land on which temporary crops are grown (often referred to as net cropped area). The sum of the areas of all temporary crops grown (gross cropped area) may be greater than net cropped area because of successive cropping (see paragraphs 11.104–11.105). The comparison between net cropped area and gross cropped area provides the basis for measuring the cultivation intensity. To avoid confusion with other similar terms, viz., gross area and net area used in other FAO publications, the reader is encouraged to refer to paragraphs 35 and 58 of the publication FAO (1982).

11.29. Land under temporary meadows and pastures include land temporarily cultivated with herbaceous forage crops for mowing or pasture. A period of less than five years is used to differentiate between temporary and permanent meadows. If country practice differs from this, the country definition should be clearly indicated in census reports.

11.30. Land temporarily fallow is arable land at prolonged rest before re-cultivation. This may be part of the holding's crop rotation system or because the normal crop cannot be planted because of flood damage, lack of water, unavailability of inputs, or other reasons.

11.31. Land is not considered temporarily fallow unless it has been, or is expected to be, kept at rest for at least one agricultural year. If the census is conducted before sowing or planting has been completed, the area lying fallow at that time that will be put under crops soon afterwards should be classified as land under temporary crops, not as fallow land. Fallow land temporarily used for grazing should be classified as "fallow" if the land is normally used for growing temporary crops.

11.32. Land remaining fallow for too long may acquire characteristics requiring it to be reclassified, such as "permanent meadows and pastures" (if used for grazing), "forest or other wooded land" (if overgrown with trees), or "other land" (if it becomes wasteland). A maximum idle period should be specified – five years is usually suitable. Land cultivated on a two- or three-year rotating basis is considered to be fallow if it was not cultivated during the reference year. Land temporarily fallow should be distinguished from land abandoned by shifting cultivation; the former is part of the holding, whereas the latter is not.

11.33. Land under permanent crops refers to: land cultivated with long-term crops which do not have to be replanted for several years; land under trees and shrubs producing flowers, such as roses and jasmine; and nurseries (except those for forest trees, which should be classified under "forest or other wooded land"). Permanent meadows and pastures are excluded from land under permanent crops.

11.34. Permanent meadows and pastures include land used permanently (for five years or more) to grow herbaceous forage crops, through cultivation or naturally (wild prairie or grazing land).

11.35. Forest and other wooded land is land not classified as mainly "agricultural land" that satisfies either of the following definitions:

- Forest land is land with crown cover of more than 10 percent of trees able to reach a mature height of 5 metres or more. It includes natural and plantation forests. Areas that are temporarily not under trees but are expected to revert to forest are included. Forest tree nurseries that form an integral part of the forest should be included.
- Other wooded land is land with: (i) crown cover of 5–10% for trees able to reach a height of 5 metres or more at maturity; or (ii) crown cover of more than 10% for trees not able to reach a height of 5 metres at maturity; or (iii) shrub or bush cover of more than 10%.

11.36. A clear distinction must be made between "forest and other wooded land" and "land under permanent crops". Plantations of rubber, palm, and other cultivated food tree crops are generally considered to be permanent crops, whereas plantations of bamboo, cork oak, eucalyptus for oil, or any

other cultivated non-food tree crops are considered to be forest and other wooded land. However, there may be some special cases, which countries should handle according to national conditions and practices. The treatment of borderline cases should be clearly stated in the presentation of census results.

11.37. Other land includes all other land on the holding, not elsewhere classified. It includes uncultivated land producing some kind of utilizable vegetable product, such as reeds or rushes for matting and bedding for livestock, wild berries, or plants and fruit. It also includes land which could be brought into crop production with little more effort in addition to that required in common cultivation practices. Also included under this category is: land used for aquaculture; land occupied by buildings; parks and ornamental gardens; roads or lanes; open spaces needed for storing equipment and products; wasteland; land under water; and any other land not reported under previous classes.

11.38. Based on FAO's recommended land use classification in Figure 11.1, arable land is land that is used in most years for growing temporary crops. It includes land used for growing temporary crops in a twelve month reference period, as well as land that would normally be so used but is lying fallow or has not been sown due to unforeseen circumstances. Arable land does not include land under permanent crops or land that is potentially cultivable but is not normally cultivated. Cropland is the total of arable land and land under permanent crops. Agricultural land is the total of cropland and permanent meadows and pastures.

11.39. Data on area of holding must refer to a point of time, usually the day of enumeration or another day close to it. In determining land use, reference is made to the activities carried out during a twelve-month or even longer reference period. Usually, the census reference year is used for this purpose. If the land use changed during the year – for example, fruit trees were planted on formerly rice land – the land should be assigned to the present use.

0008 TOTAL AREA OF HOLDING

11.40. Area of holding provides a measure of the size of the holding, which is an important element in the agricultural census analysis. Total area of holding is a derived item, obtained by summing the areas under each of the land use categories (see paragraphs 11.20–11.39). Often, land data are collected parcel by parcel and the total area of holding is derived by summing the area of each parcel.

11.41. Total area of holding is the area of all the land making up the agricultural holding. It includes all land operated by the holding without regard to title or legal form. Thus, land owned by members of a household but rented to others should not be included in the area of the holding. Conversely, land not owned by members of a household but rented from others for agricultural production purposes should be included in the holding area. The area of holding may be zero, such as where the holding keeps livestock but has no land; this is called a landless holding.

11.42. The holding's land may consist of one or more land parcels, located in one or more separate areas or in one or more territorial or administrative units, providing the parcels are part of the same economic production unit and share the same production means, such as labour, farm buildings, machinery and draught animals. See paragraph 3.33 for more information on defining holding units when land is located in more than one administrative unit.

11.43. In determining the area of the holding, the following types of land should be included:

- agricultural land, land used for growing temporary crops, land used for permanent crops, meadows and pastures, and fallow land;
- kitchen gardens;
- forest or other wooded land;
- bodies of water owned or in owner-like possession by the holding, regardless of their use;
- other farmyard and land occupied by farm buildings;

- land for which a holding does not have any rights to agricultural use, except for the products of the trees grown on it.

11.44. The following special cases should be noted:

- Where an agricultural holding is operated by a household, the land area of the household's house should be included, provided the house is located on the holding (and not, for example, in a nearby village or town), and is used solely for residential purposes.
- Where shifting cultivation is present, the area of holding should include the area under crops during the census reference year, and the area prepared for cultivation but not sown or planted at the time of enumeration. Land abandoned prior to the reference period should be excluded.
- Open rangeland, such as land open to communal grazing, is not considered to be part of the holding. For holdings having access to communal grazing land, their share of such land should not be included in the area of the holding unless the holding has been specifically assigned a certain area delimited by fencing or other form of boundary demarcation.
- A body of water owned or in owner-like possession by the holding is included as part of the area of holding, but a body of water that is rented from others for use for aquaculture or other purposes should be not included in the area of the holding.

11.45. Data on area of holding must refer to a point of time, usually the day of enumeration or another day close to it. Where a holder bought land during the census reference year, the area of land bought should be included in the area of the holding; where a holding sold land during the census reference year, the area sold should be excluded. See paragraph 3.35 for more information.

0009 LAND TENURE TYPES ON THE HOLDING

- *Legal ownership or legal owner-like possession*
- *Non-legal ownership or non-legal owner-like possession*
- *Rented from someone else*
- *Other types of land tenure*

11.46. Item 0009 refers to whether the holding is operated under the specific land tenure types. A holding may have one or more tenure types corresponding to each land parcel. This item is different from earlier agricultural census programmes, which provided for data on the area of the holding under each land tenure type – this is now included as supplementary Item 0103.

11.47. Land tenure refers to the arrangements or rights under which the holder operates the land making up the holding. Unlike earlier programmes, a distinction is made between legal and non-legal ownership, as this is one of the keys to tenure security. There are many different systems of formal and informal land tenure around the world and the distinction between legal and non-legal ownership is often blurred. Some broad guidelines are given in the following paragraphs, but it is recognized that countries need to define land tenure types according to national circumstances.

11.48. Broadly speaking, legal ownership or legal owner-like possession describes land rights that provide statutory security of tenure. Security of tenure has various aspects. Importantly, the ownership must be recognized by the state, and administrative structures must be in place to ensure that property rights are enforceable. This may be done through a formal land title system, but could also include certain forms of customary land tenure arrangements where land rights are registered or certified in some way. Typically, legal ownership implies that the owner of land has the right to determine how the land is used (within certain constraints), and may have the right to sell or rent out the land. It also implies that the owner may access credit using the land as collateral. The following types of tenure arrangements may be included under this heading:

- The holder or members of the holder's household possess title of ownership, which gives the

holder the right to determine the nature and extent of the use of the land.

- The land is held under conditions that enable it to be operated as if legally owned by the holder or members of the holder's household. A common type of legal owner-like possession is where land is operated under hereditary tenure, perpetual lease, or long-term lease, with nominal or no rent.
- The land is held under a tribal or traditional form of tenure, which is legally recognized by the state. Such arrangements usually involve land being held on a tribal, village, kindred or clan basis, with land ownership being communal in character but with certain individual rights being held by virtue of membership in the social unit. Such arrangements can be formalized through the establishment of legal procedures to identify the community's land and to manage the land rights of community members.

11.49. Non-legal ownership or non-legal owner-like possession describes a variety of informal land tenure arrangements, which do not provide security of tenure, and where circumstances could arise where the holder may be dispossessed of the land. The following types of tenure arrangements may be included under this heading:

- The holder or members of the holder's household have operated the land without interruption for a long period without any form of legal ownership, title, long-term lease, or payment of rent.
- The land is operated under a system in which a rent-free plot of tribal or other communal land is received and retained as long as it is kept under cultivation by the recipient's personal and household labour, but which cannot be sold or mortgaged.
- The holder is operating land owned by the state, without any legal rights.
- The land operated by the holder is held under a tribal or traditional form of tenure, which is not recognized by the state and outside the realm of the law.

11.50. Rented land from someone else means land that is rented or leased by the holding from other persons, usually for a limited time period. Rental arrangements can take different forms. Land may be rented for an agreed sum of money and/or produce, for a share of the produce, or in exchange for services. Land may also be granted rent free. For more information on different rental conditions, see paragraph 11.59.

11.51. There are various other types of land tenure. One example is land operated on a squatter basis; that is private or public land operated without ownership title and without the owner's consent. Other land tenure types include: land operated under transitory tenure forms, such as trusteeship; land received by members of collective holdings for individual use; and land under inheritance proceedings. Countries may add further classes to suit local conditions.

11.52. Land tenure refers to the current status of the land operated by the holding. The collection of data should relate specifically to that land. Land rented out to others should be excluded. The reference period for land tenure data is usually the day of enumeration. For information on tabulation of land tenure data, see Figure 12.1.

Supplementary items

0101 LOCATION (for each parcel)

11.53. For the purposes of the agricultural census, a holding is divided into parcels, where a parcel is any piece of land, of one land tenure type, entirely surrounded by other land, water, road, forest or other features not forming part of the holding or forming part of the holding under a different land tenure type. A parcel may consist of one or more fields or plots adjacent to each other. The concept of a parcel used in the agricultural census may not be consistent with that used in cadastral work. The reference period is a point of time, usually the day of enumeration.

11.54. A distinction should be made between a parcel, a field and a plot. A field is a piece of land in a

parcel separated from the rest of the parcel by easily recognizable demarcation lines, such as paths, cadastral boundaries and/or hedges. A field may consist of one or more plots, where a plot is a part or whole of a field on which a specific crop or crop mixture is cultivated.

11.55. The location of the parcel is important when disaggregating land data by administrative units. In an agricultural census, the location of a holding is usually identified by where the farm buildings or agricultural machinery are located (see paragraph 11.4). If the location of each parcel is not identified, all parcels would be assigned to the location of the holding, which could lead to inconsistencies with data from other sources. The location of the parcel refers to the administrative unit in which the parcel is located. For more on collecting location data, see paragraphs 11.5–11.6.

0102 AREA (for each parcel)

11.56. For the definition of a parcel, see paragraphs 11.53–11.54. For information on how to determine the area of holding, see paragraphs 11.40–11.45. Note that the sum of the parcel areas must be equal to the total area of the holding.

0103 LAND TENURE (for each parcel)

- *Legal ownership or legal owner-like possession.*
- *Non-legal ownership or legal owner-like possession.*
- *Rented from someone else.*
- *Other types of land tenure.*

11.57. “Land tenure types” was included as Item 0009 in the list of recommended core census items to provide data on whether the holding had the specified land tenure types. Item 0103, land tenure, refers to the tenure type of each parcel. This information can be used in conjunction with the parcel area to estimate the area under different land tenure types.

11.58. Note that a parcel must be of one tenure type (see paragraph 11.53). Refer to paragraphs 11.46–11.52 for definitions of land tenure and a description of the different land tenure types. The reference period is usually the day of enumeration.

0104 TERMS OF RENTAL (for each parcel)

- *For an agreed amount of money and/or produce*
- *For a share of produce*
- *In exchange for services*
- *Under other rental arrangements*

11.59. This item relates to the conditions under which land is rented from others. It applies to parcels “rented from someone else” in Item 0103, and refers to the current rental arrangements. Rental arrangements may take different forms.

- Land rented for an agreed sum of money and/or produce is usually the result of a straightforward transaction between the owner of the land and the holder, who takes responsibility for managing and operating the land.
- Share of the produce, or in exceptional cases an equivalent in money, covers the situation where a share amount is agreed upon by the owner and the holder depending on local conditions and the type of agriculture involved. Technical responsibility for management is usually exclusively with the holder, but is sometimes shared, to a limited degree, with the owner. Here, the owner may contribute tools, fertilizers or other aids, and may also share the economic risks.
- Exchange for services refers to where the holder is granted use of the land in return for services. Often, it is in lieu of wages, such as where an agricultural labourer operates a piece of land in

return for which he/she must work, unpaid, for the landlord for a certain number of days. Another example is where a holder is granted use of land in partial payment for services to government, religious organization or other institution.

- Other rental arrangements include land granted rent free, perhaps under stipulated conditions such as growing certain crops.

0105 PRESENCE OF SHIFTING CULTIVATION (for each parcel)

11.60. Shifting cultivation is a farming practice whereby a particular piece of land is cultivated for some years and then abandoned for a period sufficient to restore its fertility by natural vegetative growth before being re-cultivated. Often, fertilizers are not used. As a result, the productivity of the cultivated land quickly deteriorates and the land is abandoned because it becomes economically unviable to continue cultivating the land. Abandoned land usually takes a long time to regain fertility by natural processes. Sometimes, farmers cultivate the land on a rotating basis. Some holders move their dwellings when they shift to new land; others do not. Shifting cultivation is also known as “slash-and-burn cultivation”.

11.61. Data are collected in respect of land cultivated using shifting cultivation methods during a twelve month period, usually the census reference period.

0106 NUMBER OF YEARS SINCE CLEARED (for each parcel)

11.62. The purpose of this item is to better understand the extent of recent land clearances, especially where shifting cultivation is present or where deforestation is a concern. Usually, it will only be necessary to collect data in broad ranges, such as: in the last one year; 1–3 years ago; 4 or more years ago.

11.63. Where different parts of the parcel are cleared at different times, the time when most of the land was cleared should be reported. If land is re-cleared after being left uncultivated for a long time, the most recent land clearance should be taken.

0111 PRESENCE OF SOIL DEGRADATION: TYPE AND DEGREE (for the holding)

- *Soil erosion (none/light/moderate/severe)*
- *Chemical degradation (none/light/moderate/severe)*
- *Physical degradation (none/light/moderate/severe)*

11.64. Soil degradation is the decline in soil quality caused by natural processes or, more commonly, improper use by humans. Its consequences include: loss of organic matter; decline in soil fertility; decline in structural condition; erosion; adverse changes in salinity, acidity or alkalinity; and the effects of toxic chemicals, pollutants or excessive flooding.

11.65. Three categories of soil degradation are shown. Soil erosion is the displacement of soil material by running water, rainfall, wind or other factors, resulting in a decline of arable layers. Chemical degradation refers to deterioration in the chemical make-up of the soil because of loss of nutrients and/or organic matters, salination, acidification or pollution. Physical degradation refers to the physical deterioration of the soil, such as compaction, crusting and sealing, water-logging, and subsidence.

11.66. Degree refers to the extent of the particular type of degradation, as follows:

- None: there is no degradation of the given type on the holding.
- Light: the productivity of the land on the holding is slightly reduced but restoration would be possible with modifications in the farm management system.

- Moderate: the productivity of some of the holding's land is considerably reduced, and substantial improvements would be needed to restore full agricultural potential.
- Severe: most of the holding's land is so badly degraded that it cannot be recovered and agricultural production is no longer possible in much of the holding. "Desertification" is one type of severely degraded land.

11.67. The intention of Item 0111 is not to get a technical assessment of the state of the holding's land, but to get the holder's overall impressions of the extent to which land degradation is present on the holding and the effect it is having on agricultural output. It is usually not worthwhile collecting these data parcel by parcel; a broad assessment for the holding as a whole is usually sufficient. Collecting soil degradation data can be difficult, and questionnaires need to be carefully designed. Specific questions may need to be asked about the most common types of soil degradation, and enumeration aids provided to help enumerators assess the extent of the degradation. The reference period for soil degradation data is usually the day of enumeration.

Theme 02: Irrigation and water management

Core items

0010 PRESENCE OF IRRIGATION ON THE HOLDING

11.68. Item 0010 is recommended for inclusion in the core module to provide a sampling frame for the census supplementary irrigation survey and for other irrigation surveys. This item also helps to better understand cropping practices and the constraints on improving agricultural productivity.

11.69. Irrigation refers to purposely providing land with water, other than rain, for improving pastures or crop production. Irrigation usually implies the existence of infrastructure and equipment for applying water to crops, such as irrigation canals, pumps, sprinklers or localized watering systems. However, it also includes manual watering of plants using buckets, watering cans or other devices. Uncontrolled land flooding by overflowing of rivers or streams is not considered irrigation.

11.70. Irrigation includes any process under which water is moved from a water source to apply to an agricultural crop. Water for irrigation may come from various sources, including rivers, dams or wells. The irrigation water may be the product of a major irrigation scheme serving many farmers over a large area, or a local scheme serving a small community. Farmers may also carry out irrigation individually using informal arrangements to obtain water from rivers, streams, wells or ponds, using equipment such as a pump or manual methods such as buckets. In urban and peri-urban areas, irrigation may be carried out with hoses and buckets, sometimes using the municipal water supply.

11.71. Irrigation implies the "fully controlled" supply of water, as opposed to other types of water management where the availability of water depends on rainfall conditions. Water management activities such as controlling flood waters to water crops (spate irrigation), water control methods in wetland areas, and flood recession cultivation should not be included as irrigation. These types of activities are covered in Item 0206 in the supplementary component. The use of water from water harvesting facilities, such as roof water harvesting, may be included as irrigation if the water supply is reliable.

11.72. Item 0010 refers to whether irrigation took place on the holding during a twelve-month reference period, usually the census reference period. The item relates to the actual use of irrigation, not to whether the holding is equipped for irrigation. The infrastructure for irrigation may exist on a holding – that is, irrigation facilities such as canals and sprinkler systems are available – but these facilities may not actually be used by the holding during the reference year because of water shortages, lack of fuel, or inability to pay water fees. Irrigation refers to whether water was provided, regardless of whether the quantity of water was sufficient.

Supplementary items

0201 AREA OF LAND IRRIGATED ACCORDING TO LAND USE TYPE (for the holding)

- Land under permanent crops
- Land under temporary crops
 - Single-irrigated crop
 - Multiple-irrigated crops

11.73. See paragraphs 11.69–11.72 for the definition of land irrigated. See paragraph 11.33 for the definition of land under permanent crops and paragraphs 11.27–11.28 for the definition of land under temporary crops.

11.74. Note that area irrigated in Item 0201 refers to the physical area of land irrigated, not the total area of crops irrigated. Thus, land irrigated for successive crops in different seasons within the reference year is only counted once in computing the area of land irrigated, and shown under multiple-irrigated crops. Land under temporary crops with single-irrigated crop refers to land with a single irrigated crop during the reference year, or land with successive crops with irrigation being used for only one of the crops during the reference year.

11.75. Item 0201 is a holding level item. However, for operational reasons, countries may find it easier to collect the data at the parcel level and aggregate up to the holding level. Countries may wish to include this item in the core module if a supplementary irrigation module is not conducted.

0202 AREA IRRIGATED ACCORDING TO METHOD OF IRRIGATION (for the holding)

- Surface irrigation
- Sprinklers
- Localized irrigation

11.76. See paragraphs 11.73–11.74 for more information on land irrigated.

11.77. Surface irrigation refers to a system for partially or completely covering land with water for the purpose of irrigation. There are various types including furrow, border-strip and basin irrigation. Basin irrigation includes submersion irrigation for rice.

11.78. Sprinkler irrigation refers to pipe networks through which water moves under pressure before being delivered to the crop via sprinkler nozzles. The system basically simulates rainfall in that water is applied through overhead spraying. Sprinkler irrigation systems are sometimes known as overhead irrigation systems.

11.79. Localized irrigation is a system where the water is distributed under low pressure through a piped network, in a pre-determined pattern, and applied as a small discharge to each plant. There are several types: drip irrigation (where drip emitters apply water slowly to the soil surface), spray or micro-sprinkler irrigation (where water is sprayed to the soil near individual plants or trees), and bubbler irrigation (where a small stream is applied to flood small basins or the soil adjacent to individual trees). Other terms commonly used to refer to localized irrigation are micro-irrigation, trickle irrigation, daily flow irrigation, drop-irrigation, sip irrigation, and diurnal irrigation.

0203 AREA IRRIGATED FOR EACH CROP TYPE (for the holding)

11.80. Item 0203 refers to the area of crops irrigated, as opposed to the area of land irrigated given in Items 0201 and 0202 (see paragraph 11.74). For example, a plot of 0.4 ha with crops irrigated in two seasons within the reference year is recorded as 0.4 ha of land irrigated in Item 0201, and 0.8 ha of crops irrigated in Item 0203. Analysis of the crop area irrigated in relation to the land irrigated provides information on cropping intensity under irrigation.

11.81. For temporary crops, Item 0203 refers to that portion of the harvested area (see paragraphs 11.99–11.111) irrigated during the reference year. For permanent crops, Item 0203 refers to that portion of the area of permanent crops on the day of enumeration (see paragraph 11.118) irrigated at some time during the reference period. See paragraphs 11.73–11.74 for the definition of irrigation.

0204 SOURCES OF IRRIGATION WATER (for the holding)

- *River/lake/pond (by gravity)*
- *River/lake/pond (pumping)*
- *Dam/reservoir*
- *Deepwell/tubewell*
- *Shallow well*
- *Municipal water supply*
- *Treated waste water*
- *Desalinated water*
- *Other*

11.82. Item 0204 refers to whether irrigation water used on the holding was obtained from the given sources. A holding may obtain water from more than one source. The reference period is the census reference year. See paragraphs 11.73–11.74 for the definition of irrigation.

11.83. Usually, source of irrigation water refers to the original source of the water. Thus, if a canal network is used to distribute water from a dam to farmers, the source of the water is the dam, not the canal. Countries may need to adapt the classes given to meet their needs.

0205 PAYMENT TERMS FOR IRRIGATION WATER (for the holding)

- *Did not pay for water*
- *Paid for water*
 - *Fee per area*
 - *Fee per volume*
 - *Other*

11.84. This item refers to whether payment was made for the irrigation water used on the holding. If payment is made in more than one way – such as both on an area and volume basis – it should be assigned to the “other” category. The reference period is the census reference year. See paragraphs 11.73–11.74 for the definition of irrigation.

0206 OTHER TYPES OF WATER MANAGEMENT PRACTICES (for the holding)

- *Wetland and inland valley bottoms*
- *Flood recession cultivation*
- *Spate irrigation*
- *Other*

11.85. Item 0206 refers to whether specific water management practices, other than irrigation, were used on the holding. See paragraph 11.71 for more on the differences between irrigation and water

management. A holding may have more than one type of water management activity. Data on water management are normally collected in respect of a twelve-month reference period, but data may be distorted by unusual weather conditions in the reference year; for example, if there is no flood recession cultivation because of low flood levels. A longer reference period, such as a three-year period, may be considered for some countries.

11.86. Wetland and inland valley bottoms are lowland areas subject to seasonal flooding, that are used for cropping when covered with water. Water control structures, such as canals, may be constructed to help in the crop cultivation.

11.87. Flood recession refers to areas along the edge of rivers or other water bodies where cultivation occurs, making use of water from receding floods. Floating rice is included as a flood recession crop. Structures may be built to retain the receding water.

11.88. Spate irrigation is a method of random irrigation using the floodwaters of a normally dry water course or riverbed (wadi). Spate irrigation is also referred to as floodwater harvesting. There are two types of spate irrigation. One is where floodwater is harvested in streambeds and spread through the wadi in which the crops are planted. Cross-wadi dams are constructed with stones or earth, often reinforced with gabions. A second type is where floodwater is diverted from the seasonal rivers into adjacent embanked fields for direct application. Here, a stone or concrete structure raises the water level within the wadi to enable it to be diverted.

0207 PRESENCE OF DRAINAGE EQUIPMENT (for the holding)

11.89. For the purpose of the agricultural census, drainage is the artificial removal of excess surface water or groundwater, together with dissolved substances, from the land surface by means of surface or subsurface conduits, to enhance agricultural production. It does not include natural drainage of excess water into lakes, swamps and rivers.

11.90. Presence of drainage equipment means that the equipment is present on the holding at a point of time, such as the day of enumeration. There are different types of drainage facilities. Surface drains divert excess surface water away from an agricultural area to prevent inundation. Subsurface drains allow excess water and dissolved substances to flow through the soil to open wells, moles, pipe drains and/or open drains. On irrigated land, drainage may control salinity or water-logging. Management of water for flood recession cropping is considered water management (Item 0206), not drainage.

Theme 03: Crops

Core items

0011 TYPES OF TEMPORARY CROPS ON THE HOLDING

11.91. Past agricultural census programmes included an item on the area of each temporary crop harvested. In WCA 2010, information on temporary crops for the core module is limited to whether the holding grew each specific type of crop, as provided in Item 0011. This item is useful for sampling frames for census supplementary modules and other crop surveys. It is proposed that area data for temporary crops be collected in the crop supplementary module as Item 0301. Some countries may want to include crop area data in the core census module, especially to provide benchmarks for current crop production statistics.

11.92. Temporary crops are those with a less than one year growing cycle (see paragraphs 11.27–11.28). Some countries may wish to include only the major crops; however, it should be borne in mind that, because it is based on complete enumeration, the core census module may provide the only means of getting reliable data for the minor crops.

11.93. A crop classification is shown in Appendix 3 to help in collecting and tabulating crop data. An

alphabetical list of crop names is also given in Appendix 4. The crop classification is not exhaustive and all crops listed do not apply to any one country. Countries should expand or abridge the crop list, taking into account the importance of specific crops in each country. For a dominant crop, a country may wish to provide further detail, such as by season (for example, summer/winter or wet/dry seasons), land type (for example, lowland/upland), or variety (for example, local/improved). Countries may also wish to disaggregate data by end-use, such as whether it is to be used for food or animal feed. Refer to Appendix 3 for more information on the principles underlying the crop classification and the problems in providing further detail.

11.94. Data on temporary crops are collected in respect of a twelve-month reference period to reflect crops grown in all seasons of the year. The agricultural year is usually the most suitable reference period because enumerators and farmers can usually easily relate to that period in reporting crop data. Crops are normally reported according to the year in which they are harvested (see paragraphs 11.102–11.103). See paragraph 3.35 for more information on how to report crops where land is bought.

0012 TYPES OF PERMANENT CROPS ON THE HOLDING AND WHETHER IN COMPACT PLANTATIONS

11.95. Past agricultural census programmes included data on the area and number of trees for each permanent crop. In WCA 2010, information on permanent crops for the core module is limited to whether each specific type of crop is present on the holding, and which crops are grown in a compact plantation. This is provided in Item 0012. This item is useful for sampling frames for census supplementary modules and other crop surveys. It is proposed that more detailed data on permanent crops be collected in the crop supplementary module as Items 0311–0314. Some countries may wish to include some more detailed data in the core census module.

11.96. Permanent crops are crops with a more than one year growing cycle (see paragraph 11.33). Permanent crops may be grown in a compact plantation or as scattered trees/plants and both should be included. A compact plantation includes plants, trees and shrubs planted in a regular and systematic manner, such as in an orchard. Plants, trees or shrubs forming an irregular pattern but dense enough to be considered as an orchard, are also considered a compact plantation.

11.97. Countries should refer to Appendices 3 and 4 for a list of crops. Countries should expand or abridge the crop list, taking into account their circumstances and data needs (see paragraph 11.93).

11.98. For permanent crops, data are collected in respect of a single point of time, usually the day of enumeration. Thus, a permanent crop is included if it is present on the holding on the day of enumeration.

Supplementary items

0301 AREA OF TEMPORARY CROPS HARVESTED (for each temporary crop type)

11.99. Temporary crops are crops with a less than one-year growing cycle (see paragraphs 11.27–11.28). For help in identifying crops, refer to the crop classification in Appendix 3 and the alphabetical list of crops in Appendix 4. See also paragraphs 11.93. The reference period for data on the area of temporary crops is the census reference year or the agricultural year.

11.100. Area harvested refers to the total area from which the crop is gathered. Thus, area destroyed because of drought, flooding, pest attack or any other reason is excluded. In this regard, a certain percentage loss criterion – for example, yield is less than 20% of what it normally is – is used to determine if a crop is destroyed. Crop that is damaged but not destroyed is included in the area harvested. If possible, the area harvested should exclude uncultivated patches, footpaths, ditches, headlands, shoulders and shelterbelts.

11.101. Area harvested only covers crops grown to maturity. It does not include nurseries, where plant propagation materials are produced for sale or use on the holding (see paragraphs 11.144–11.145). If, for example, rice seedlings are grown for transplanting on the holding, the nursery area of the seedlings is not included in the area harvested, but the harvest from the transplanted seedlings is included. Area harvested includes all crop harvested regardless of its end-use; thus, area harvested includes crop harvested for human consumption, for animal feed, or for any other reason. Crops grown to maturity for harvesting specifically for the production of seed (“seed fields”) should be included.

11.102. Usually, it is easy to assign crops to the reference year. However, a crop may be planted in one agricultural year and harvested in the next agricultural year. Sometimes, the crop season extends over a long period, with the result that part of the crop is harvested in one agricultural year and the rest in the next agricultural year. Problems also occur where the seasons differ in different areas of the country and, for example, a particular seasonal crop grows late in the agricultural year in one area and early in the following agricultural year in another area.

11.103. The recommended approach is to identify crops covered by the census according to whether they are harvested during the reference year, with special exceptions made for end-of year crops. An alternative approach used by some countries is to identify a crop according to the season in which it grows, rather than referring specifically to the agricultural year. Depending on the treatment of end-of-year crops and the timing of the data collection, some crops may not yet be harvested at the time of the census, and data on “expected area harvested” should be reported.

11.104. Temporary crops may be grown more than once on the same land in the same agricultural year. This is known as successive crops. This may involve the same crop or different crops and is important in countries with more than one cropping season. For successive crops, the area should be reported for each crop each time the land is sown during the year. Thus, if a 1 ha field is used for growing rice in the summer and maize in the winter, the crop area data are shown as 1 ha of rice and 1 ha of maize. If two rice crops – a summer crop and a winter crop – are grown on the 1 ha field during the year, the area of rice is shown as 2 ha. Successive crops may be grown by two different holdings and should be counted accordingly.

11.105. Successive crops should be distinguished from successive harvests of the same standing crop, such as for sugar cane or hay, where the area should be counted once only. The same applies where the same crop produces more than one product during the agricultural year, such as cotton producing both fibre and seed. Here, the area harvested should be reported under the principal product.

11.106. A plot or field in which one crop is planted between rows of another crop – for example, sorghum and groundnuts between cotton rows – is referred to as having inter-planted crops. Here, the area of the inter-planted plot or field is assigned to individual crops in proportion to the area occupied by each crop. The sum of the areas of the individual inter-planted crops must be equal to the area of the plot or field.

11.107. The same applies to mixed crops, where more than one (often many) crops are grown unsystematically in a plot or field. Here, it is more difficult to calculate areas and some estimation is needed. This may be based on quantities of seed used for crops in the mixture, plant density in the crop mixture, eye estimates of the proportions of area occupied by the component crops, or the number of plants per area unit. The sum of the areas of the individual mixed crops must be equal to the area of the plot or field.

11.108. Sometimes, countries may wish to report a crop mixture or inter-planting as a single crop unit, rather than as individual crops, because it is an important production system. Sometimes, crops are specifically grown as a mixture, especially grains, and it can be difficult to apportion the area to the individual crops. Countries may treat such cases as a single crop under a suitable crop title, such as “mixed cereals for grain”. It is recommended that, where possible, the area of such crop mixtures should also be sub-divided into their component crops to enable international comparisons to be made. Often, there are standard crop mixtures, which can help in this regard.

11.109. A temporary crop grown in a compact plantation of permanent crops – a so-called associated crop – should be distinguished from a mixed crop. Normally, the area of the temporary crop is estimated by apportioning the land in a suitable manner. See paragraph 11.121 for more information.

11.110. Sometimes, temporary crops are grown scattered around the holding and it is difficult to measure the area. Some estimation is usually possible where the crops are grown in some sort of systematic manner, such as on the bunds of a paddy field. If the crop is not planted systematically or sufficiently densely to permit the area to be measured, the crops are often omitted. Sometimes, countries impose a minimum size criterion for the collection of area data – for example, 100 square metres.

11.111. Normally, an agricultural census collects data on the area of crops harvested, not the area planted. However, it is recognized that some countries may also wish to collect data on area planted to assess crop loss.

0302 AREA OF TEMPORARY CROPS HARVESTED ACCORDING TO END-USE (for each selected crop type)

11.112. End-use is a new concept in WCA 2010, and has been introduced to help assess food supplies and the production of fodder crops.

11.113. End-use refers to what the crop is used for. Crops may be grown for use as food for human consumption, as feed for animals, or for non-food products such as tobacco and flowers. A single crop may have more than one use, such as maize being grown partly for human consumption and partly as a fodder crop. Some countries may be interested in the type of product obtained from a crop, such as whether chilies are harvested for use as fresh or dried produce, or whether cotton is harvested for fibre or seeds. Other countries may wish to identify crops used for industrial purposes. The reference period should be consistent with Item 0301, usually the census reference year.

11.114. Countries should collect end-use data according to national conditions and data requirements, focusing on crops with multiple uses. As a minimum, the following end-use types should be identified:

- *Food for human consumption*
- *Feed for animals*
- *Other uses*

0303 PRODUCTION OF TEMPORARY CROPS HARVESTED (for each selected crop type)

11.115. In the past, agricultural censuses did not normally include a crop production item because it was not considered to be structural data. In the 2010 round of agricultural censuses, it is recommended that production for selected crops be collected in the crop supplementary module. Countries should choose the crops according to their needs. Production data in an agricultural census are useful as benchmarks for current crop production statistics.

11.116. Production refers to the actual quantity of produce, after drying and processing ready for sale or consumption, and after deducting pre-harvest, harvest and post-harvest losses (FAO, 1982, paragraphs 61–68). The reference period should be consistent with Item 0301, usually the census reference year.

0311 AREA OF PRODUCTIVE AND NON-PRODUCTIVE PERMANENT CROPS IN COMPACT PLANTATIONS (for each permanent crop type)

11.117. Permanent crops are crops with a more than one-year growing cycle (see paragraph 11.33). For help in identifying crops, see Appendices 3 and 4. For the definition of a compact plantation, see paragraph 11.96.

11.118. Area of permanent crops refers to the area of the crop at a single point of time, usually the day

of enumeration. Permanent crops should only be included if they are grown for the purpose of producing crops. It does not include nurseries, where plant propagation materials are produced for sale or use on the holding (see paragraphs 11.144–11.145).

11.119. Permanent crops of productive age refer to permanent crops already bearing fruit or otherwise productive. Most tree crops and some other permanent crops become productive after a certain age. Crops at that stage should be enumerated as "of productive age" even if, due to weather or other reasons, they did not yield a harvest in the most recent season. Senile or other trees of productive age, but no longer productive, should not be considered as productive.

11.120. Two or more permanent crops grown together in a compact plantation should be treated in the same way as inter-planted or mixed temporary crops (see paragraphs 11.106–11.108).

11.121. Special procedures are needed to measure area where permanent crops are grown in a compact plantation in association with temporary crops (see also paragraph 11.109). If the density of trees/plants for the permanent crop is not affected by the presence of the temporary crops, the area of permanent crops is normally measured as the whole area of the compact plantation. This is a common situation, especially where temporary crops are grown between the rows of existing trees/plants. Sometimes, this can even be to the benefit of the permanent crop. Thus, for example, a 1 ha compact plantation of coffee grown in association with vegetables would be measured as 1 ha of coffee and, say, 0.5 ha of vegetables. In other words, the total area of the associated crops is greater than the physical area of the piece of land. This is quite different from the treatment of inter-planted or mixed crops (see paragraphs 11.106–11.108). Often, the association of temporary and permanent crops is quite complex, with several permanent and temporary crops growing together in the one compact plantation. Countries will need to develop procedures suitable for national circumstances.

0312 NUMBER OF PERMANENT CROP TREES IN COMPACT PLANTATIONS AND SCATTERED PLANTINGS (for each tree crop)

11.122. Item 0312 refers to the number of trees for scattered permanent crops for tree crops. Tree crops are defined as permanent crops in Group 3, Class 44 or Class 94 of the crop classification (see Appendix 3). Countries may wish to include other permanent crops if suitable. As with all data on permanent crops, the reference period is the day of enumeration. Nurseries are excluded (see paragraphs 11.144–11.145).

11.123. For the definition of permanent crops, see paragraph 11.33. For help in identifying crops, see Appendices 3 and 4. For the definition of a compact plantation, see paragraph 11.96. Scattered plants are those planted in such a manner that it is not possible to estimate the area. Often, they are scattered around the holding.

0313 AREA OF PRODUCTIVE PERMANENT CROPS IN COMPACT PLANTATIONS ACCORDING TO END-USE (for each selected permanent crop type)

11.124. End-use is a new item in WCA 2010. End-use refers to what the crop is used for (see paragraph 11.113). Countries should collect end-use data specific to their national conditions and data requirements, focusing on those crops with multiple uses. As a minimum, the following end-use types should be identified:

- *Food for human consumption*
- *Feed for animals*
- *Other uses*

11.125. For the definition of permanent crops, see paragraph 11.33. For the definition of a compact plantation, see paragraph 11.96. For information on area of permanent crops, see paragraph 11.118. For the definition of productive permanent crops, see paragraph 11.119. The reference period is the day of enumeration.

0314 PRODUCTION OF PERMANENT CROPS (for each selected permanent crop type)

11.126. See paragraph 11.115 for information on production data in the agricultural census. Production refers to the actual quantity of produce, ready for sale or consumption (see paragraph 11.116). The reference period is the census reference year.

0321 AREA OF LAND USED TO GROW TEMPORARY CROPS AS A SECONDARY LAND USE (for the holding)

11.127. Most temporary crops are grown on land classed as having main use “land under temporary crops” in the land use classification (see paragraph 11.27). However, temporary crops can also be grown on other land use types. They may be grown in association with permanent crops on land classed as “land under permanent crops”, or grown on land classed as “forest and other wooded land”. Also, land mainly used for aquaculture may be cropped during part of the year.

11.128. To get a complete picture of temporary crops, it is necessary to find out about land used for growing temporary crops as a secondary land use. For associated crops and crops grown in forest and other wooded land, the proportion of the parcel/field/plot used for temporary crops needs to be estimated – see paragraphs 11.109 and 11.121. Where a piece of land has a primary use which enables it to be cropped for part of the year, such as for aquaculture, the area cropped should be reported.

11.129. This item relates to land as measured in the land use classification; namely, the area on the day of enumeration according to its main use during the census reference year. Secondary land use relates to secondary activities on the land during the census reference year.

0322 USE OF EACH TYPE OF FERTILIZER (for the holding)

- *Fertilizers*
 - *Mineral fertilizers*
 - *Organo-mineral fertilizers*
 - *Organic fertilizers*
 - *Biofertilizers*
- *Other organic materials to enhance plant growth*

11.130. For the purposes of the agricultural census, fertilizers are mineral or organic substances, natural or manufactured, which are applied to soil, irrigation water or a hydroponic medium, to supply plants with nutrients or to enhance plant growth. The term “fertilizer” normally applies to sources of plant nutrients which contain at least 5 percent of a combination of the three primary nutrients (N, P₂O₅ and K₂O). Products with less than 5 percent of combined plant nutrients should be shown under the heading other organic materials to enhance plant growth. A holding may use one or more type of fertilizer.

11.131. Fertilizer usage data usually refer to a twelve-month period, usually the census reference year.

11.132. Mineral fertilizers are fertilizers prepared from inorganic materials manufactured through an industrial process. Manufacturing entails mechanical enrichment, simple crushing, or more elaborate chemical transformation of one or more raw materials. Mineral fertilizers are also known as “chemical fertilizers”, “artificial fertilizers”, and “inorganic fertilizers”.

11.133. Organo-mineral fertilizers are materials obtained through blending or processing organic materials with mineral fertilizers to enhance their nutrient content and fertilizing value.

11.134. Organic fertilizers are fertilizers prepared from processed plant or animal material and/or unprocessed mineral materials (such as lime, rock or phosphate) containing at least 5% of combined plant nutrients. Organic fertilizers include some organic materials of animal origin, such as guano, bone meal, fish meal, leather meal and blood. Other organic materials such as manure, slurry, compost and

sewage sludge contain less than the required nutrient content and should be considered as “other organic materials to enhance plant growth”.

11.135. Biofertilizers are products containing living or dormant micro-organisms, such as bacteria and fungi, that provide nutrients to enhance plant growth.

11.136. Other organic materials to enhance plant growth are any materials other than fertilizers that are applied to the soil to correct low nutrient content or any other problem. This includes manure, slurry, compost and sewage sludge, lime, gypsum, sawdust, crop residue and synthetic soil conditioners. These materials may be of widely varying compositions, including farmyard manure, liquid or semi-liquid manure, straw, compost, green manure and peat. The organic materials may contain fertilizer elements, but they are also applied to improve soil properties, such as soil structure and porosity, water-holding capacity, aeration, and temperature control.

11.137. The term manure is usually used in the sense of farmyard or animal manure, which is a mixture of solid excreta of animals with litter used for their bedding. Slurry is a mixture of liquid and solid animal excreta, with or without dilution with water. Compost consists of organic materials of animal, plant or human origin partially decomposed through fermentation. Sewage sludge is residual organic material derived from sewage. The term green manure describes fresh plant material which is locally produced and is worked into the soil without composting or digestion through animals.

0323 AREA FERTILIZED FOR EACH TYPE OF FERTILIZER AND MAJOR CROP TYPE (for the holding)

11.138. This item refers to the area of crops fertilized, according to the definition of fertilizers in Item 0322. For temporary crops, the area fertilized refers to that part of the area harvested to which fertilizers were applied some time during the census reference year. For permanent crops, the area fertilized refers to that part of the current area of permanent crops fertilized some time during the census reference year. The area of a crop fertilized may be all or part of the total area of the crop. Note that this item relates to the crops fertilized, not the land fertilized; thus, if fertilizer is used on two crops grown successively on the same land in two seasons, the fertilized area should be counted twice. Countries will wish to limit this item to the most important national crops.

0324 SOURCE OF SEED INPUTS FOR EACH MAJOR CROP TYPE (for the holding)

- *Self-production*
- *Exchanges within community*
- *Local market*
- *Seed company*
- *Donation*

11.139. This item refers how seeds were acquired. For the purpose of the agricultural census, seeds refer to any planting material, including seeds themselves, seedlings, cuttings, and small plants or trees. The reference period is the census reference year. There may be one or more sources of seeds for a given crop. Countries should limit this item to the most important national crops.

11.140. Self-production refers to seeds obtained by setting aside a portion of the previous year's crop for use as seed for the current crop. Exchanges within community are seeds obtained through loans, gifts, or other forms of reciprocal assistance, including seed-for-seed exchanges between farmers. Local market refers to the purchase of seed, either for cash or in exchange for other commodities, through markets, itinerant traders or localized trade networks. Seed company refers to seed purchased from a seed producer or supplier through a commercial arrangement. Donation refers to donations of seed from national or international institutions.

0325 TYPE OF SEED FOR EACH MAJOR CROP TYPE (for the holding)

- Certified seed of modern variety
- Uncertified seed of modern variety
- Uncertified seed of farmers' variety
- Other

11.141. This item refers to whether the seed used has been certified according to the national certification system and whether it belongs to a modern or farmer's variety. For more information on seeds, refer to paragraph 11.139. The reference period is the census reference year.

11.142. Certified seeds are those that can be certified as meeting certain national standards as regards their physical and genetic purity. Seed certification systems vary between countries. Some countries have a self-regulatory system in the seed production industry. In other countries, a government regulatory agency is responsible for controlling the seed production process and certifying that seed is of acceptable standard. Usually certified seeds are labelled in some way. For the agricultural census, seeds should be shown as "certified" only if the seed used during the reference year was purchased from the market as certified seed or otherwise received as certified seed. Only newly acquired certified seed should be included; seed collected from a crop that had been planted with certified seeds in a previous year should not be considered as certified.

11.143. Uncertified seed refers to seed that is not certified according to the national standards. These are often provided through the informal sector. Modern varieties are the products of plant breeding in the formal system by professional plant breeders. These varieties are also called "high-yielding varieties" or "high-response varieties". Countries with a system of registration and release of cultivated varieties develop lists or catalogues of released modern varieties, which can be used for the collection of these data in the agricultural census. Farmers' varieties, also known as landraces or traditional varieties, are the product of breeding or selection carried out by farmers, either deliberately or not, continuously over many generations. These varieties are clearly identified by farmers.

0326 AREA OF NURSERIES (for the holding)

11.144. A nursery is an area where young plants, trees or vines are propagated for the purpose of transplanting. Plants in a nursery are not harvested and are therefore not included in the area harvested (temporary crops in Item 0301) or current area (permanent crops in Item 0311). A nursery might be in the open or under protective cover. It may be used for the development of planting materials for the holding itself or for sale. Nurseries do not include seed fields (see paragraph 11.101).

11.145. This item refers to the area of land used for nurseries, not the total area of the nursery crops. Thus, a piece of land used during the year for nurseries for two crops should be counted only once. The reference period is the census reference year.

0327 AREA OF CROPPED LAND UNDER PROTECTIVE COVER (for the holding)

11.146. Cropped land under protective cover is land under permanent structures with a roof of glass, plastic or other material used for protecting crops against the weather, pests or diseases. Such structures may be used for growing temporary or permanent crops. Typical crops grown are vegetables, herbs and flowers. Structures to provide protection against the weather are known as "greenhouses". Temporary devices for short-term protection, such as plastic covering to protect against frosts, should not be included. Netting to protect against insects or other animals should also be excluded. Nurseries should also be excluded.

11.147. The data relate to the presence, on the day of enumeration, of protective structures that were used for growing crops during the census reference year.

Theme 04: Livestock

Core items

0013 NUMBER OF ANIMALS ON THE HOLDING FOR EACH LIVESTOCK TYPE

11.148. The number of livestock is one of the fundamental items in the core module of the agricultural census, and is especially useful as a means of providing sampling frames for livestock surveys.

11.149. Livestock refers to all animals, birds and insects kept or reared in captivity mainly for agricultural purposes. This includes cattle, buffaloes, sheep, goats and pigs, as well as poultry, bees and silkworms. Domestic animals, such as cats and dogs, are excluded unless they are being raised for food or other agricultural purposes.

11.150. This item should cover all livestock of any type being raised on the holding. Reference should be made to the list of livestock types given in Appendix 5. Sometimes, a country may wish to sub-divide an important livestock type by breed or raising method; for example, chickens may be split into local and imported breeds, or sub-divided according to whether they are raised by “free-range” or commercial methods. Some countries may wish to include only the major livestock types in the census core module, but should bear in mind that, because it is based on complete enumeration, the core module may provide the only means to get reliable data on minor livestock types.

11.151. The number of animals is the animal population on the holding at a specific point of time, usually the day of enumeration. The animal population refers to the number of animals being raised by the holding on the reference date, regardless of ownership. Animals raised include those present on the holding, as well as those being grazed on communal grazing land or in transit at the time of enumeration. Bees are counted on the basis of number of hives.

11.152. A holding is raising an animal if it has primary responsibility for looking after the animal on a long-term basis and making day-to-day decisions about its use. Most holders own and raise their own animals, but sometimes they raise animals belonging to someone else under some form of lease agreement. This may involve payment in cash or in other forms such as a share of the livestock produce. A distinction must be made between raising an animal and being employed by an animal owner to look after the animals, where the animal owner is the decision-maker. Often, such arrangements are complex; for example, a person may work as an employee under the condition that any offspring of the livestock being cared for belong to him/her. Here, he/she may be an agricultural holder in respect of some livestock, but working as an employee for other livestock.

Supplementary items

0401 TYPE OF LIVESTOCK PRODUCTION SYSTEM (for the holding)

- *Nomadic or totally pastoral*
- *Semi-nomadic or semi-pastoral*
- *Sedentary pastoral*
- *Ranching*

11.153. The livestock production system refers to the general characteristics and practices of raising livestock on the holding. Four systems are identified:

- Nomadic or totally pastoral refers to livestock raised in a situation where the agricultural holder has no permanent place of residence and does not practise regular cultivation. Livestock move from place to place with the agricultural holder and his/her household, depending on the season and availability of feed or water.
- Semi-nomadic or semi-pastoral refers to livestock raised by holders who live a semi-nomadic life. Typically, the holder has a permanent residence to which he/she returns for several

months of the year according to seasonal factors. Alternatively, the holder establishes a semi-permanent home for several months or years and may cultivate crops as a supplementary food source. Herds are moved with the holder and his/her household.

- Sedentary pastoral refers to livestock raised by holders who have a permanent residence. Often, livestock are raised in combination with growing crops.
- Ranching refers to large-scale livestock activities carried out on large areas of land set aside for extensive grazing.

11.154. Many countries find this topic unnecessary. Nowadays, nomadic and semi-nomadic households are not common and the majority of holdings are sedentary pastoral. Often, ranching is limited to a small number of corporations or government holdings, which may be able to be identified through the sector of the agricultural holding in Item 0002.

11.155. The reference period for the collection of data on type of livestock production system is a single point of time, usually the day of enumeration.

0402 USE OF VETERINARY SERVICES (for the holding)

11.156. Veterinary services cover all professional veterinary services used to protect animal health for the livestock kept on the holding, including treatment of diseases, artificial insemination, vaccination, and surgical procedures. It includes services provided by government organizations, such as through veterinary field workers, as well as by the private sector.

11.157. Data on the use of veterinary services may be collected in two ways. Data for the holding as a whole can be useful as an indicator of whether such services are generally available to the holding. Data for each major livestock type can help in assessing the animal health situation of each livestock type. Countries collect data in the form suited to their needs.

0411 NUMBER OF ANIMALS: AGE AND SEX (for each livestock type)

11.158. Age of livestock data are collected in suitable age groupings, depending on the livestock type and sometimes the breed of the animal. Typical age groupings are:

- Cattle, buffaloes: less than 1 year; 1 year or more to less than 2 years; 2 years or more.
- Sheep, goats, pigs: less than 1 year; 1 year or more.
- Horses, camels, mules/hinnies, asses: less than 1 year; 1 year or more to less than 2 years; 2 years or more to less than 4 years; more than 4 years.
- Poultry: young birds (for example, aged less than three weeks); adult birds.
- Other animals: according to circumstances.

11.159. Countries often collect age and sex data only for the major livestock types. For poultry, it is often not necessary to distinguish between male and female young birds; for example, chickens may be divided into: adult males; adult females; chicks.

11.160. The reference period for the collection of all data on animal numbers is a single point of time, usually the day of enumeration. For more information on the measurement of livestock numbers, see paragraphs 11.149–11.152.

0412 NUMBER OF ANIMALS ACCORDING TO PURPOSE (for each livestock type)

11.161. Purpose refers to the main reason for the animals being kept. This is usually clear-cut, as specific breeds of animal are used for certain purposes. The specific purposes shown will depend on the type of livestock and local conditions. Normally, the following main purposes are identified:

- Cattle, buffaloes: milk; meat; draught power; breeding.
- Sheep, goats: milk; meat; wool; breeding.
- Pigs: meat; breeding.
- Horses, camels, mules/hinnies, asses: milk; meat; draught power; breeding.
- Poultry: meat; eggs; breeding.
- Other animals: according to circumstances.

11.162. The time reference for animal numbers by purpose is the day of enumeration, consistent with Item 0411. To assess the main purpose, reference should be made to the main use of the animals during the census reference year or the intended main use in the future. Countries usually collect data on purpose for the major livestock types only.

0413 NUMBER OF MILKING ANIMALS ACCORDING TO MILK STATUS (for each livestock type raised for milking)

- *In milk*
- *Dry*

11.163. This item relates to the livestock types raised for milking, as identified in Item 0412. For the purposes of the agricultural census, a milking animal is defined as an animal present on the day of enumeration, that has been milked at some time during the census reference year. Milk status refers to whether the milking animal is in milk or dry on the day of enumeration.

0414 NUMBER OF ANIMALS BORN (for each livestock type)

0415 NUMBER OF ANIMALS ACQUIRED (for each livestock type)

0416 NUMBER OF ANIMALS SLAUGHTERED (for each livestock type)

0417 NUMBER OF ANIMALS DISPOSED OF (for each livestock type)

- *Sold or otherwise disposed of for slaughter*
- *Other disposals*

0418 NUMBER OF ANIMALS DIED FROM NATURAL CAUSES (for each livestock type)

11.164. These five items provide information on the population dynamics of livestock herds, such as measures of reproductive rates and take-off rates. Countries should decide on the livestock types to be covered by these data, according to national conditions.

11.165. The five items refer to the number of events (such as births and deaths) during a given reference period. The reference period depends on the type of livestock and operational factors. For cattle, buffaloes and other large animals, a one-year reference period – normally, the census reference year – is usually taken. For smaller animals, such as sheep, goats and pigs, a six-month reference period is often used. For poultry, a one-month reference period is often most suitable.

11.166. Number of animals born refers to births during the reference period to animals that were part of the holding at the time of the birth. Births to animals belonging to another holding should not be included.

11.167. Number of animals acquired refers to purchases or other livestock acquisitions by the holding during the reference period. This includes animals received as gifts or as payment for work.

11.168. Number of animals slaughtered refers to the number of slaughterings during the reference period of animals that were being raised on the holding. This includes slaughterings carried out on the holding, as well as slaughterings carried out by someone else on behalf of the holding. Sales of live animals for slaughtering – for example, to an abattoir – should be shown as disposals under Item 0417. Slaughterings of other people's animals on the holding should not be included.

11.169. Number of animals disposed of refers to sales or other disposals during the reference year of animals being raised on the holding. It includes animals sold, as well as animals given as a gift, for payment for services, or for other reasons. Two types of disposal are shown. Sold or otherwise disposed of for slaughter includes all disposals of animals for the purpose of slaughtering. This is usually in abattoirs, meat packing plants or butchers' shops, but also includes donations of animals for slaughter for festivals and other community events. Slaughterings carried out on a fee basis by, for example, a butcher on behalf of the holding should be included under slaughterings in Item 0416. Other disposals include sales and other disposals that do not involve slaughterings.

11.170. Number of animals died from natural causes refers to deaths from natural causes during the reference year of animals that were being raised on the holding at the time of their death.

0419 TYPES OF FEED (for each livestock type)

- *Primary products*
 - *Produced on the holding*
 - *Purchased*
- *Processed products*

11.171. Countries should decide on the livestock types to be covered by this item, according to national conditions. Type of feed refers to the source of feed for the livestock type for a given reference period, usually the census reference year. More than one type of feed may be used for a specific livestock type during the reference year; for example, animals may be grazed during the summer but need to be hand-fed during the winter.

11.172. Primary products include green fodder such as pasture grasses, forage crops, other crops and tree leaves, as well as harvested by-products and hay. This is sub-divided into whether it was produced on the holding or purchased. Processed products include concentrates and compound feeds.

Theme 05: Agricultural practices

Core items

0006 MAIN PURPOSE OF PRODUCTION OF THE HOLDING

- *Producing mainly for home consumption*
- *Producing mainly for sale*

11.173. The aim of this item is get a broad indicator of the extent to which agricultural holdings are participating in the market economy. Purpose of production data are usually collected only for agricultural holdings in sector "single-holding household" in Item 0002.

11.174. Where a holding sells some produce and uses the rest for home consumption, main purpose should be which of the two – home consumption or sale – represents the larger value of agricultural production. Sale includes selling produce for cash or in exchange for other produce (barter). Disposal of agricultural produce in other ways – for example, for payment of labour, sending to family members, gifts, or payment of taxes – should not be considered in assessing the main purpose of production.

11.175. Data on main purpose of production can be collected for any suitable reference period, such as the main harvest or the census reference year. Several questions may be needed to obtain this item.

Supplementary items

0501 USE OF AGRICULTURAL PESTICIDES (for the holding)

- *Insecticides*
- *Herbicides*
- *Fungicides*
- *Rodenticides*
- *Other pesticides*

11.176. Pesticides are substances intended to prevent, destroy or control in plants or animals diseases and pests, including vectors of human and animal diseases, unwanted species of plants, or to control the behaviour or physiology of pests or crops during production or storage. They include insecticides, herbicides, fungicides, acaricides, termiticides and rodenticides and other substances. The time reference for pesticide data is the census reference year.

11.177. Insecticides are substances used to destroy, control or repel insects. Herbicides are substances used to destroy or inhibit the growth of plants such as weeds. Fungicides are substances that destroy or control the growth of fungi. Acaricides and termiticides are used for the control of mites, ticks and termites. Rodenticides are substances that destroy, kill, repel or control rodents. Other pesticides include substances intended for use as a plant-growth regulator, defoliant, desiccant, fruit thinning agent, or sprouting inhibitor and substances applied to crops either before or after transport.

0502 USE OF GOOD AGRICULTURAL PRACTICES (for the holding)

11.178. The concept of Good Agricultural Practices (GAP) refers to practices adopted by farmers to ensure that agricultural products are safe, of high quality, and produced in an environmentally and socially responsible way. GAP has many components, including practices related to soil and water management, cropping systems, crop protection, livestock rearing, animal health, on-farm processing, working conditions for farm workers, waste management, and landscape and wildlife protection. Some specific GAP related practices are: integrated pest management (IPM); integrated production systems; and conservation agriculture, such as minimum tillage cultivation. GAP related topics are important given the increasing globalization of the food economy and the problems many countries face in meeting the standards required to participate in international markets.

11.179. It is not possible to recommend specific GAP related items for the agricultural census. There is no standard concept of GAP, and practices and standards vary from country to country depending on national conditions and agricultural markets. Some practices are specific to particular crops. In some countries, particular types of GAP practices are promoted. Countries need to determine the types of practices important to their own agricultural production and marketing.

0503 USE OF ORGANIC AGRICULTURAL PRACTICES (for the holding)

11.180. Organic agriculture is an agricultural production system that promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. Organic agriculture is based on specific standards for achieving socially, ecologically and economically sustainable agro-ecosystems. A key feature of organic agriculture is that chemical fertilizers and pesticides are not used. Other practices such as the use of genetically modified (GM) crops are also proscribed. Terms such as "biological" and "ecological" are sometimes used to describe organic agriculture. Organic agriculture may apply to crops or livestock. Requirements for organically produced foods differ from those for other agricultural products in that production procedures are an intrinsic part

of the identification and labelling of, and claim for, such products.

11.181. For the purposes of the agricultural census, an agricultural production system must satisfy several conditions to be considered organic.

- It must be organic by intent and not by default. Thus, non-sustainable production systems that do not use synthetic inputs are not considered organic.
- The produce must mainly be for sale, not for self-consumption. This is because the market, through pricing mechanisms and certification requirements, provides the best way to assess whether a product is organic.
- The produce must be labelled or otherwise recognized by consumers as organic. Many countries have a national certification system to certify that products have been produced in accordance with organic standards. Non-certified organic food may be sold in farmers' markets or at the farm-gate, where the consumer knows where the produce comes from, and (usually) is prepared to pay a premium price for it because it is recognized as organic.

11.182. Item 0503 relates to whether organic agricultural practices were used on the holding during the census reference year.

0504 USE OF GENETICALLY MODIFIED CROPS ACCORDING TO CROP TYPE (for the holding)

11.183. Item 0504 relates to whether specific types of genetically modified crops were used on the holding during the census reference year. Genetically Modified (GM) crops are living organisms that possess a novel combination of genetic material obtained through the use of modern biotechnology.

0505 SELECTED MACHINERY AND EQUIPMENT USED ON THE HOLDING BY SOURCE (for the holding)

11.184. This item identifies machinery and equipment used on the holding, wholly or partly for agricultural production. The reference period is usually the census reference year. Machinery and equipment used exclusively for purposes other than agricultural production should be excluded. Machinery or equipment owned by the holder, but not used should also be excluded.

11.185. A broad concept of machinery and equipment is used for the agricultural census, covering all machinery, equipment and implements used as inputs to agricultural production. This includes everything from simple hand tools, such as a hoe, to complex machinery such as a combine harvester. However, the main interest centres on farm mechanization. Advanced countries focus on machinery such as tractors, harvesting machines and office equipment. However, less developed countries may be interested in some animal or even hand-powered items of equipment, as well as machinery. Items of machinery and equipment should be clearly described; a seeder, for example could be anything from simple manual seeding device to a complex piece of machinery. To help identify machinery and equipment items for the agricultural census, a classification of machinery/equipment is given in Appendix 6, along with a list of some of the major items under each heading. Countries might like to further sub-divide items – for example, by capacity.

11.186. Source of the machinery/equipment refers to the means by which the holder obtained the right to use the specific item. The following response categories are recommended:

- *Owned solely by the holder or members of the holder's household*
- *Owned by the holding jointly with other holdings*
- *Provided by the landlord*
- *Provided by other private holders (excluding cooperatives)*
- *Provided by a cooperative*
- *Provided by a private agricultural service establishment*
- *Provided by a government agency*

0506 NON-RESIDENTIAL BUILDINGS (for the holding)

11.187. This item identifies non-residential buildings on the holding, used wholly or partly for agricultural purposes. The reference period is usually the census reference year. Non-residential buildings used exclusively for purposes other than agricultural purposes should be excluded. For each type of non-residential building the number, tenure and size should be collected.

Type of non-residential building

- For keeping livestock other than poultry (area)
- For keeping poultry (area)
- For storing agricultural products (area or volume)
- For mixed or other purposes (area)

Tenure of non-residential building

- Owned
- Rented
- Other

0507 PERCENTAGE OF EACH MAJOR AGRICULTURAL PRODUCT SOLD (for the holding)

11.188. This item is important for countries with significant home consumption of agricultural produce. Only the most important staple food crops, such as rice, wheat, maize and cassava, should be included. Percentage should relate to the quantity of production. Usually, this item is collected in ranges such as: 0–19%; 20–49%; 50% or more. Data for this item can be collected for any suitable reference period, such as the main harvest or the census reference year.

Theme 06: Agricultural services**Supplementary items***0601 RECEIPT OF CREDIT FOR AGRICULTURAL PURPOSES (for the holding)**0602 SOURCE OF CREDIT (for the holding)**0603 TYPE OF COLLATERAL FOR CREDIT (for the holding)*

- The holder's land
- Other assets
- Other type of collateral

0604 PERIOD OF LOAN OR CREDIT (for the holding)

11.189. Credit for agricultural purposes refers to any type of credit received for purposes related to the operations of the agricultural holding. This includes credit for purchasing crop and livestock inputs, constructing farm buildings, and purchasing farm machinery. Credit not related to agricultural operations, such as for construction of the holder's house, for other family businesses, or for consumption expenditure, should be excluded.

11.190. Receipt of credit refers to whether credit was made available during the reference year, not whether there was outstanding credit at the time of the census. A holder may have made use of credit on more than one occasion during the year, and therefore more than one source or type of collateral may be reported. Credit received by the holder as well as members of his/her household should be included.

11.191. The term "credit" is used widely to cover borrowing money directly, as well as buying goods and services on credit. Borrowing money may be done through a lending institution, other organizations, or persons for a specific purpose such as buying a tractor. Buying goods and services on credit refers to an

arrangement for buying goods or services where payment is delayed beyond delivery, such as where fertilizer is purchased on the basis that payment will be made after the crop has been harvested.

11.192. In Item 0602, source of credit refers to who provided the credit. The specific source classes will depend on the institutional arrangements for credit in the country. Typical groups are:

- *Commercial bank*
- *Agricultural development bank*
- *Cooperative credit society*
- *Money lender*
- *Input supplier*
- *Self-help group*
- *Family or friends*
- *Government*
- *Other sources*

11.193. In Item 0603, collateral is defined as assets pledged as security for a loan of money, which means that if the borrower defaults on the terms of the loan, the collateral may be sold and the proceeds used to pay off the loan. For the purpose of the agricultural census, collateral is used in a wider sense to also cover guarantee provided for the purchase of goods and services. This is usually related to the production of agricultural goods, but may also be based on assets.

11.194. The collateral for larger holdings is often the holder's land. This is prevalent where there is a well-developed land tenure system with legal ownership of land. Otherwise, other assets may be used as collateral. For a loan to buy farm machinery, for example, the purchased machinery may be used as collateral. Other type of collateral covers the purchase of goods and services on credit based on agreements to pay at a later date, or credit received without any collateral on a personal guarantee basis.

11.195. Period of loan or credit refers to the period over which the loan or credit is to be paid off, as agreed at the time the loan was received. Where credit was received more than once during the reference year, the period should be reported for the loan or credit of highest value. Normally, the period of loan or credit is reported in ranges to reflect the likely reasons for using credit, such as for short-term (for the current crop) or long-term (for major capital outlays). Typical groupings are:

- *Less than 12 months*
- *12–35 months*
- *36 months or more*

0605 SOURCES OF AGRICULTURAL INFORMATION (for the holding)

- *Extension services*
- *Radio*
- *Television*
- *Newspapers*
- *Agricultural newspapers*
- *Input agencies*
- *Internet*
- *Other farmers*
- *Other*

11.196. Sources of agricultural information refer to where the holder received information to help manage the agricultural holding. This includes information on weather, selection of crop varieties, new agricultural practices, farm machinery, credit facilities, plant diseases and pests, marketing, and commodities or crop varieties being promoted by the Government. The reference period is the census reference year.

11.197. Most farmers use various sources of information. Usually, countries prefer to collect data on all the sources. Extension services refer to advice received through government or non-government

extension services, and is covered in more detail in Item 0606.

0606 SOURCES OF AGRICULTURAL EXTENSION SERVICES (for the holding)

11.198. Agricultural extension refers to the provision of agricultural advice and information to crop and livestock producers. Extension services may be provided by government institutions, non-government organizations, farmer organizations, educational institutions, informal grass-roots organizations, and others. Extension services may cover advice to farmers in areas such as farm management, selection of crop varieties, use of inputs such as fertilizers, credit, farm mechanization, animal health, plant protection, sustainable development, and marketing. Extension services may also be used by Governments to distribute inputs, disseminate market information, and promote the production of particular commodities or crop varieties.

11.199. In most countries, government is the principal provider of extension services through its network of agricultural field staff. The organization of government extension services varies from country to country. Sometimes, extension services are centralized in a single ministry with all-round extension officers providing advice in all disciplines. In other countries, there are specialized extension services in crops, livestock and perhaps other fields.

11.200. There are many different methods of implementing extension services. Often, extension workers visit farmers to provide on-the-spot advice. Demonstrations of new farming practices or technologies are sometimes arranged for small groups of farmers, or more formal training programmes organized for larger groups of farmers. Sometimes, study tours are arranged for farmers to observe agricultural practices in other places. Usually, agricultural extension is free of cost to the farmer; sometimes, it is not.

11.201. Item 0606 refers to the use of agricultural extension services by the holding during the census reference year. It refers to personal contact with extension personnel or direct participation in extension activities such as a farm demonstration. It does not include accessing extension material through printed brochures, radio, television or the Internet. Also, extension services should be limited to formal contacts with extension workers specifically employed for that task; advice received from other informal sources should not be included. A farmer may have received extension services from more than one source.

11.202. The categories for sources of agricultural extension will depend on the way extension services are organized in the country. Countries may want to identify the discipline (such as crops or livestock) and the type of organization providing the service (such as government institution or farmer organization). Typical source categories are:

- *Government organization*
 - *Crops*
 - *Livestock*
- *Farmer association*
- *Other*

0607 TRAVELLING TIME TO NEAREST PERIODIC OR PERMANENT AGRICULTURAL PRODUCE MARKET (for the holding)

11.203. This item is included to help assess how easy it is for farmers to access markets. Travelling time is usually expressed in ranges, such as:

- *Less than 30 minutes*
- *30–60 minutes*
- *60–120 minutes*
- *More than 2 hours*

11.204. Sometimes, travelling times vary according to, for example, the wet and dry seasons. Some countries may wish to collect these data for different seasons.

11.205. Periodic or permanent agricultural produce market refers to a market where farmers can bring their produce for sale. The markets operated every day or on certain days of the week.

Theme 07: Demographic and social characteristics

Core items

0005 HOUSEHOLD SIZE

11.206. Household size is the number of members of the holder's household. This can be obtained either by listing all household members or asking a direct question on the number of household members. A household is one or more persons living together who make common provision for food or other essentials for living (see paragraph 3.26).

11.207. It is recommended that household data only be collected for agricultural holdings in sector "single-holding household" in Item 0002. It would be difficult to interpret household data for other types of holdings and could lead to double counting of household members. Household data are not normally provided for other types of holdings in the household sector in Item 0002. Some countries collect household data for "multiple-holding households" in Item 0002 by referring to the group of persons within the household operating the holding.

11.208. Household size can be measured in two ways: (i) persons present on the day of enumeration; or (ii) persons who are usually resident in the household. The usual residence approach – called the *de jure* concept – is recommended for the agricultural census, and is the way official population estimates are normally made. Usually, it is not difficult to identify a person's place of usual residence. However, sometimes members of a family are studying or working away from the family home and return home regularly. The treatment of such cases should be clearly stipulated.

11.209. With a *de jure* concept, the data on household size relates to persons who, at the time of the census, are usually resident in the household.

Supplementary items

0701 WHETHER HOLDING IS PART OF AN AGRICULTURAL HOUSEHOLD (for the holding)

11.210. An agricultural census covers all units engaged in agricultural production activities, regardless of size or importance. For some households, agricultural production on the holding is the household's only or predominant activity, but for other households, it may only provide a secondary source of income. A household may be engaged in other economic production activities (see Item 0016) or its members may work in paid jobs. A household with a small holding of, for example, only 0.4 ha of land may or may not be food secure, depending on the extent to which it relies on the agricultural holding for its livelihood.

11.211. Item 0701 is recommended for inclusion as a supplementary item to identify what might be termed "genuine farmers". This can provide an important classification item for the census tabulation. It can also be useful for sampling frame purposes. Item 0701 relates only to holdings in sector "single-holding household" in Item 0002.

11.212. A household containing an agricultural holding may have four sources of income: (i) agricultural production income; (ii) income derived from economic production activities other than agricultural production; (iii) income from paid employment; and (iv) pensions, investment income and remittances. An agricultural household is a household for which agricultural production income is the largest of these four income sources. Agricultural production income includes income from growing crops and raising livestock; it excludes income from a paid agricultural job. Income includes income in cash and in kind. For more information on the concept of agricultural household, see *Handbook on Statistics on Rural Development and Agricultural Household Income* (UN et al, 2005, Chapter IX).

11.213. Note that there are various types of non-agricultural households. For some, agricultural

production is a sideline activity to the household's main economic production activity or employment. For others, the household is forced to rely on other sources of income because income from agricultural production is low. The latter may be of particular concern to agricultural policy-makers, and countries may wish to draw out this distinction in the analysis.

11.214. It is not necessary to collect detailed income data to determine whether the holding is part of an agricultural household. Income data are difficult to collect, even in an in-depth sample survey, and is not normally feasible in an agricultural census. Instead, respondents should be asked to provide an overall assessment of their agricultural production activities in relation to the three other sources of income. The important thing is not to get quantitative measures of income from the different sources, but to distinguish between agricultural and non-agricultural households. Normally, the reference period for the collection of agricultural household data is the census reference year.

0702 NATIONAL/ETHNIC GROUP OF HOUSEHOLD HEAD OR AGRICULTURAL HOLDER (for the holding)

11.215. In many countries, there are major differences in agricultural practices between different national or ethnic groups, which are important to measure in an agricultural census. For the agricultural census analysis, a single national/ethnic group indicator for the holding is needed, and this is usually done by referring to the household head or the agricultural holder. This may not always be appropriate.

11.216. The national/ethnic groups used by a country could be based on nationality, religion, language or customs, depending on their importance in the community and their dissimilar agricultural characteristics. There should also be consistency with the population census and other statistics.

0711 SEX (for each household member)

- Male
- Female

0712 AGE (for each household member)

11.217. Age refers to the age in completed years at the time of the census. Data on age may be collected by asking directly for the age or by obtaining the person's date of birth. Age is sometimes difficult to collect. In some countries, people have different ways of calculating age, such as age next birthday. There is also a tendency for people to round ages to the nearest five or ten years. Date of birth can also be difficult to collect. Often, it is known only according to an alternative calendar such as a lunar calendar. Sometimes, people can only identify their date of birth in relation to major events, or may only know the season not the date. There are various data collection tools available to help overcome these problems.

0713 RELATIONSHIP TO HOUSEHOLD HEAD OR OTHER REFERENCE PERSON (for each household member)

11.218. Relationship data are collected by first identifying the household head (or any other reference person) and then recording the relationship of each other household member to that person. In the agricultural census, relationship data are only collected to determine household and family composition. Therefore, it doesn't matter who the reference person is or, if it is the household head, whether that title reflects the person's role. Countries may use any reference person considered most appropriate to national circumstances. It is not intended that household head data – for example, by gender – will be analysed in the agricultural census. Instead, census data will be analysed in relation to different household composition types, such as a married couple with children or an extended household.

11.219. The relationship categories should be based on international standards used in the population census programme (UN, 1998, paragraph 2.73), ensuring consistency with other national statistics. The recommended categories are given below. Some countries may wish to identify more complex relationship structures, such as child/parent relationships for different family units within a household.

- *Head*
- *Spouse*
- *Child*
- *Spouse of child*
- *Grandchild or great grandchild*
- *Parent or parent of spouse*
- *Other relative*
- *Other unrelated person*

11.220. Households should be divided into household composition types based on the family nucleus. The following groupings used in the population census (UN, 1998, paragraph 2.82) are usually suitable:

- *One-person household*
- *Nuclear household*
 - *Married couple family with children*
 - *Married couple family without children*
 - *Father with children*
 - *Mother with children*
- *Extended household*
- *Composite household*

0714 MARITAL STATUS (for each household member)

11.221. Marital status is the status of the household member in relation to the marriage laws or customs of the country. The marital status categories should be based on international standards used in the population census programme (UN, 1998, paragraph 2.96), ensuring consistency with other national statistics. The following groupings are recommended:

- *Never married*
- *Married*
- *Widowed and not remarried*
- *Divorced and not remarried*
- *Married but separated*

11.222. Countries may wish to take local conditions into account in determining the marital status categories. In some countries, the category “consensual union” may be needed to reflect unions outside marriage laws or customs. Other countries may need to take into account concubinage, polygamous or polyandrous practices.

11.223. Marital status is sometimes collected for all persons, regardless of age, but often it is restricted to those above the minimum legal marriage age. Whichever approach is taken, countries should show marital status data in the census tables for persons aged 15 years and over, to provide international comparisons.

0715 EDUCATIONAL ATTAINMENT (for each household member)

11.224. Educational attainment data are useful in an agricultural census to examine the effects of education on characteristics such as cropping systems, agricultural practices and household food security. Educational attainment refers to the highest grade of formal education completed or attended by a person. In the agricultural census, educational attainment data should be collected for both the agricultural holder and the agricultural holder’s spouse, if present, as the educational levels of both can be important factors in agricultural and household activities.

11.225. Data on educational attainment needs to be recorded in suitable categories. Attention should be paid to consistency with other national statistical collections, especially the population census, and to the International Standard Classification of Education (ISCED) (UNESCO, 1997). For international comparison purposes, educational attainment should be classified into at least three levels of education: primary, secondary, and post-secondary. Each level may be further sub-divided to meet national needs.

Theme 08: Farm labour

Basic concepts in labour statistics

11.226. Theme 08 covers items related to the two types of labour inputs on agricultural holdings: (i) labour provided by household or family members, and (ii) paid outside workers.

11.227. Data on farm labour in the agricultural census should be based on the recommendations on labour statistics provided by ILO (ILO, 2000). Under ILO guidelines, the concept of activity status, broadly speaking, is used to measure whether a person of working age is part of the supply of labour for the production of economic goods and services. A person who is part of the supply of labour is said to be economically active, whereas a person who is not part of the supply of labour is said to be not economically active.

11.228. For the purposes of defining activity status, economic goods and services are defined according to SNA principles and covers the production of goods and services for sale or for home consumption (UN et al, 1993). For agricultural work, it covers all crop and livestock production and related activities, including supplying water, post-harvest activities, and preparation of food for employees on the holding. It does not include domestic and personal services provided for the household's own consumption.

11.229. There are two main ways to measure a person's activity status. One is the concept of "currently active", which measures activity status in relation to a short reference period such as a week. The other is the concept of "usually active", which measures a person's main activity status over a long reference period such as a year. One of the advantages of the "currently active" concept is that data collection is easier because it only requires activity information for a short reference period. "Current activity" is usually preferred for making international comparisons. However, "usual activity" is generally used in the agricultural census because it is more suited to measuring the seasonal aspects of agricultural work and because the emphasis in the census is on the source of labour inputs rather than measuring employment as such. The "usually active" concept is recommended for use in the agricultural census.

11.230. A person is determined to be usually economically active or not usually economically active according to the person's main or usual activity during a long specified period such as a year. Criteria need to be set for this purpose, based on the number of months, weeks or days of activity during the long reference period. For example, a person would be classified as usually economically active if their total period of employment and unemployment was 50 percent or more of the length of the long reference period (that is 26 weeks or more for a reference year). A person would be classified as not usually economically active if their total period of employment and unemployment was less than half the reference period. In order to capture agricultural labour input completely, the agricultural season could be used for the long reference period, instead of the reference year. However for assessing employment statistics in general, it is the reference year that is mostly used. Within the category usually economically active, persons may be usually employed if the period of employment during the reference period exceeded that of unemployment, otherwise they would be usually unemployed. Employed persons work in one or more jobs, and employment data – such as status in employment, occupation, and time worked – are obtained about each job. For the census of agriculture, employment data should focus on those jobs that are related to agriculture, separately identifying main jobs and secondary jobs.

11.231. The minimum age limit for economically active persons should be set in accordance with national conditions, but should not be higher than 15 years. A lower minimum age limit may be appropriate in developing countries where children often participate in agricultural work. To facilitate international comparisons, tabulations should distinguish between persons aged under 15 years and those aged 15 years and above. Where countries set the minimum age limit below ten years, tabulations should also distinguish children aged under ten years. It is not normal to apply a maximum age limit as elderly persons can still make a contribution to agricultural work.

11.232. As for all items in the agricultural census, countries need to carefully design questionnaires for the collection of farm labour data, suitable to national circumstances. Activity status data can only be collected by asking each person a series of specific questions about his/her work activities or, if he/she

is not working, about his/her availability for, and steps taken to find, work. Accurately measuring usual activities over a twelve-month reference period is difficult and special data collection measures are needed to ensure that reporting is complete and accurate. Efforts must also go into ensuring that data are not biased as a result of enumerators misunderstanding the concept of activity status, especially for women and other family members contributing labour to work on the holding.

11.233. An additional point to bear in mind is that a person who is usually employed over the reference period (year) may not necessarily be always employed in agricultural work. It may be useful, therefore, to identify agricultural labour separately from non-agricultural labour and/or to ask specific questions about any job during the agricultural season that is related to agriculture (including jobs that are not the main job). More detail on international standards for labour statistics is contained in various ILO publications (ILO, 1990; ILO, 2000). Countries should refer to this material to clarify the treatment of special cases.

Supplementary items

0801 ACTIVITY STATUS (for each household member of working age)

- *Economically active*
 - *Employed*
 - *Unemployed*
- *Not economically active*

11.234. Activity status refers to whether a person is usually economically active or usually not economically active (see paragraph 11.230; ILO, 2000, pp. 24–28).

11.235. An employed person is one whose main activity during the reference year was to be in paid employment or self-employment. Paid employment includes those at work, as well as those with a job but temporarily not at work because of illness or holiday, but retaining a formal attachment to that job. Formal job attachment needs to be determined according to national circumstances, taking into account the continued receipt of wages and the guarantee of a return to the job. Self-employment includes those operating a business or otherwise working for profit or family gain, including contributing family workers (see paragraph 11.244).

11.236. The family is often an important source of labour on agricultural holdings and should be given special attention in measuring the activity status of household members. Special care is needed with homemakers. Activities related to care of the home or children do not constitute employment in a statistical sense, but many homemakers also do some work on the holding, especially in peak periods such as during crop planting or harvesting. Many homemakers also have other specific tasks on the holding, such as looking after the kitchen garden or caring for livestock. In measuring activity status, some countries set a minimum requirement for the amount of time worked; in doing this, countries should ensure that the contribution of unpaid family workers, especially women, are fully reflected.

11.237. An unemployed person is one whose main activity during the reference year satisfies the following three criteria:

- without work, that is he/she is not employed;
- currently available for work, that is he/she would be willing to do work if work was available; and
- seeking work, that is he/she is taking specific steps to find work.

11.238. Criteria for determining “available for work” and “seeking work” must be established based on national circumstances, taking into consideration how the labour market is organized and how people find jobs. Persons not seeking work because of temporary illness, previous arrangements to start a new job in the future, or on temporary or indefinite lay-off without pay, are included as unemployed.

11.239. The unemployment concept is difficult to apply in countries where the labour market is not well organized or where self-employment or informal labour arrangements are predominant. This commonly

applies in rural areas of developing countries. Often, the “seeking work” criterion is relaxed because many people do not seek work because they believe that no jobs are available.

11.240. A person is not economically active if his/her main activity status during the reference year was neither employed nor unemployed. Typical examples are: persons below the minimum age for measuring economic activity; homemakers; students; persons too old or too sick to work; and persons living from the proceeds of property, investments, interest, rent, royalties or pensions.

0811 STATUS IN EMPLOYMENT OF MAIN JOB (for each economically active household member)

- *Employee*
- *Own-account worker*
- *Contributing family worker*
- *Member of producers' cooperative*
- *Not classifiable*

11.241. Status in employment refers to status of an economically active person with respect to the type of employment contract the person has with his/her job (ILO, 2000, pp. 20–23). Note that activity status relates to whether the person was mainly employed, unemployed or not economically active during the reference year, while status in employment refers to the characteristics of a particular job – in this case the person's the main job – or (for the unemployed) the status in work of the person's last job.

11.242. An employee is a person in a paid employment job (see paragraph 11.235). Paid employment jobs are those which provide remuneration not directly dependent on the revenue of the unit for which the person works. Typically, an employee receives wages and salaries for the time worked. However, remuneration may also be in the form of in-kind payments such as food, or on a commission or piece-rate basis.

11.243. An own-account worker is one who is working on his/her own account, or with one or more partners, in a self-employment job (see paragraph 11.235), where that person has overall responsibility for the management of the producing unit. In a self-employment job, the remuneration is directly dependent on the profits derived from the goods and services produced. Agricultural holders are own-account workers if their main job is work on the holding.

11.244. Contributing family workers are those who are working in a self-employment job in an establishment operated by a person living in the same household, and whose level of responsibility or commitment in terms of working time or other factors is not sufficient to be considered an own-account worker. Thus, the agricultural holder is the own-account worker and any other household member whose main job is working on the holding is a contributing family worker. Where it is customary for people to work without pay in a business operated by a related person not living in the same household, the requirement of living in the same household is often relaxed.

11.245. A member of a producers' cooperative is one working in a self-employment job as a member of a cooperative, where each member takes part in managing the cooperative on an equal footing with other members.

11.246. Not classifiable covers those such as the unemployed who cannot be classified to any of the previous categories.

0812 OCCUPATION OF MAIN JOB (for each economically active household member)

11.247. Occupation is defined as the main tasks and duties carried out by an employed person in a particular job (ILO, 1990, pp. 2–5). Occupation relates to a particular job; a person may have more than one job, each with its own occupation. For the agricultural census, occupation data are usually collected in respect of the main job. The occupation of an unemployed person relates to the work done in a previous job. Occupation is not relevant if the person is not economically active.

11.248. Occupation should not be confused with industry: occupation is the type of work done by the person, while industry is the activity of the establishment in which the person works. Thus, a person working as a machine operator for a logging firm would have occupation "machine operator" and industry "forestry". Also, occupation should not be confused with status in employment, which describes whether a person is an employee, own-account worker, etc. (see paragraphs 11.241–11.246).

11.249. Occupation should be coded according to a standard national occupation classification, which should be compatible with the International Standard Classification of Occupations (ISCO) (ILO, 1990). Most occupation classifications provide different levels of coding and the agricultural census should be coded at the lowest possible level consistent with the information provided in the questionnaire and the level at which data are to be presented in the census tabulations. Usually, occupation is coded to at least the second or third levels, corresponding to the ISCO sub-major or minor groups.

11.250. ISCO provides the following ten major groups:

1. *Legislators, senior officials and managers*
2. *Professionals*
3. *Technicians and associate professionals*
4. *Clerks*
5. *Service workers and shop and market sales workers*
6. *Skilled agricultural and fishery workers*
7. *Craft and related trade workers*
8. *Plant and machinery operators and assemblers*
9. *Elementary occupations*
10. *Armed forces*

11.251. Agriculture related occupations are mainly in major groups 1, 2, 3, 6, 8 and 9, but most persons in rural areas report occupations belonging to groups 6 and 9. ISCO emphasizes the skill level required to do a particular task and a distinction is made between skilled agricultural workers (Group 6) and farm-hands/labourers, which are classified under elementary occupations (Group 9).

- Skilled agricultural workers are those whose "tasks require the knowledge and experience necessary to produce farm products" (ILO 1990, p. 6 and pp. 157–171).
- Persons with elementary occupations are those whose "occupations require the limited knowledge and experience necessary to perform mostly simple and routine tasks, involving the use of hand-held tools and in some cases considerable physical effort and with few exceptions only limited personal initiative or judgement. Tasks include: digging and shovelling; loading and unloading; raking, pitching and stocking hay; watering and weeding; picking fruit and other crops; feeding, watering and cleaning animals; etc." (ILO 1990, p. 7 and p. 258).

11.252. It can be difficult to distinguish these two occupation groups. Countries need to develop criteria suited to national conditions to determine what types of agricultural workers are deemed to have the skills necessary to be classified in Group 6. Also to be considered are the questions needed to provide the information necessary to code on the required basis. Just asking a single question about occupation is often not satisfactory because of confusion between occupation and industry or status in employment, and it usually does not give the information needed to make a clear distinction between skilled and unskilled workers. Some countries ask two occupation related questions – the first about the kind of work done, and the second about the main tasks and duties – which provides a better basis for coding a person's occupation. Some countries define the holder as a skilled worker and all other persons working on the holding as unskilled; this is not completely satisfactory.

0813 TIME WORKED IN MAIN JOB (for each economically active household member)

0814 TIME WORKED ON THE HOLDING (for each economically active household member)

11.253. Past agricultural census programmes have used the concept of permanent/occasional worker to measure the volume of labour inputs to the holding. A permanent worker was someone whose services are used regularly and continuously during the reference year. Often, this was interpreted as working six

months or more during the year. This was difficult to apply, given the seasonality of agricultural work. A person may work regularly and continuously on a holding when work is available, but that may only be for a few months of the year. Alternatively, a person may work continuously but only for a few hours a week.

11.254. It is recommended that a different approach be used for the 2010 round of agricultural censuses, based on the concept of time worked (ILO, 2000, pp. 39–40). Time worked is the time spent working in a particular job during the twelve-month reference period. Time worked includes regular working hours as well as overtime, time spent waiting or standing by, and other short breaks. It excludes meal breaks and absences because of holidays or sickness. Two time worked items are recommended: time worked in main job, and time worked on the holding.

11.255. Time worked has two elements. Full-year/part-year work measures the number of months or weeks of work carried out during the year. Full-time/part-time work measures the number of hours worked per day or week, as assessed against some sort of norm such as a 40-hour week.

11.256. Countries should give careful consideration to the application of the time worked concept, taking into account national circumstances and the way in which the time worked data are to be presented in the census tabulations. One option is to present data according to specified weeks per year and hours per day groupings. Another option is to summarize time worked according to the following categories:

- *Full-time job*
 - *Worked 1–3 months in the year*
 - *Worked 4–6 months in the year*
 - *Worked 7 or more months in the year*
- *Part-time job*
 - *Worked 1–3 months in the year*
 - *Worked 4–6 months in the year*
 - *Worked 7 or more months in the year*

11.257. Comparability with previous agricultural censuses could be achieved by defining permanent/occasional workers in terms of the above classes; for example, a permanent worker could be one working for seven or more months of the year in a full- or part-time job.

11.258. Much effort needs to go into designing suitable questionnaires and data collection procedures for time worked data. At a minimum, it will be necessary to ask each person about the months per year and hours per week worked for each job. However, these questions alone will not usually be sufficient to get reliable data, especially given the complex organization of farm labour in many countries. One option is to ask detailed questions about the nature and duration of all activities carried out by each person during the year. Diaries could be used for this purpose. Such in-depth questions would improve data quality but would add to the length of the questionnaire. However, this is the rationale for the current modular approach, with in-depth data such as this being collected in a sample-based supplementary module rather than by complete enumeration in the core module.

0821 NUMBER OF EMPLOYEES ON THE HOLDING: TIME WORKED AND SEX (for the holding)

- *Male employees*
- *Female employees*

11.259. Items 0801–0814 are about the economic activity of the holding's household members and the labour they supply to the holding. The current item, Item 0821, is about the use of paid workers on the holding. The underlying concepts for these data are based on the ILO recommendations on labour statistics (see paragraphs 11.226–11.232).

11.260. An employee on the holding is a person who had a job on the holding at some time during the reference year, whose status in employment for that job was "employee" (see paragraph 11.242); that is, he/she worked on the holding at some time during the year in a paid employment job. This includes permanent employees, as well as seasonal, part-time and casual workers. Employees are usually paid

in cash, or in the form of food or other farm produce, but there may be other remuneration arrangements. Exchange of labour should be treated as a form of paid employment. Persons employed by the household but not working on the holding are excluded. Family members are excluded from Item 0821 because their labour inputs are covered under Items 0801–0814. The term “employee on the holding” is equivalent to the term “agricultural worker other than members of the holder’s household” used in previous agricultural census programmes.

11.261. A distinction is made between hiring an employee to work on the holding for a defined remuneration, and engaging a contractor to provide certain agricultural services for an agreed fee. Item 0821 covers only employees. Contract work is covered in Item 0823. For more information on the difference between employees and contractors, see paragraph 11.267.

11.262. The number of employees on the holding is a count of the number of persons who were an employee on the holding at some time during the reference year. Thus, a person who worked on the holding several times during the reference year is counted only once.

11.263. For the 2010 round of agricultural censuses, the concept of time worked is used to replace the permanent/occasional concept used in previous agricultural census programmes. See paragraphs 11.253–11.258 for more information. Time worked data for employees should be consistent with the same data for household members. In this regard, the time worked classification in paragraph 11.256 should be suitable. Comparability with previous agricultural censuses can be achieved by defining permanent/occasional workers in terms of the given time worked classes.

11.264. As for all time worked data, care is needed in designing suitable questionnaires and data collection procedures (see paragraph 11.258).

0822 FORM OF PAYMENT FOR EMPLOYEES (for the holding)

11.265. Item 0822 is important in countries where there are various forms of remuneration for employment of labour. It refers to the form or forms of payment used on the holding during the reference year. The form of payment for each employee is usually not reported. The payment methods can vary from country to country and each country needs to determine categories suitable to national conditions. Typical form of payment groups are:

- *With money*
- *With farm produce*
- *Exchange of labour*
- *Other forms of in-kind payment*

0823 USE OF CONTRACTORS FOR WORK ON THE HOLDING ACCORDING TO TYPE (for the holding)

11.266. This item is about whether agricultural service contractors were used for work on the holding during the census reference year.

11.267. Using an agricultural service contractor must be distinguished from hiring an employee to work on the holding, which is covered in Item 0821. An employee is a person employed under an explicit or implicit agreement that provides the person with a certain agreed remuneration. Often, there are legal requirements attached to hiring an employee such as the provision of social benefits to the employee (such as sick leave), payment of taxes (such as payroll tax), and responsibility for work safety (such as insurance for workplace accidents). A contractor, on the other hand, is an own-account worker (see paragraph 11.243), who normally receives no social benefits as part of the work carried out. Often, there are legal requirements for a contractor, such as having the required business licence or payment of value added taxes. Sometimes, it can be difficult to differentiate between an employee and a contractor.

11.268. The type of contractor groupings used depends on national conditions. Typically, specialized work

on the holding is contracted out, such as crop protection, tree pruning, crop harvesting, sheep shearing, or farm administration.

Theme 09: Household food security

Basic household food security concepts

11.269. Household food security refers to the situation where all members of a household at all times are consuming enough safe and nutritious food for normal growth and development, and for an active and healthy life. A household is food insecure if it is not able to afford to buy enough food or is limited in food supply and therefore may not be able to eat safe or nutritionally adequate food. Food security refers to conditions related to a household not producing enough food and not having enough resources to buy food; it does not refer to other causes of hunger such as dieting or physical inability to cook/buy food.

11.270. Household food security is a complex, multi-dimensional problem. Concepts such as food security, food insecurity, hunger and vulnerability are difficult to measure. Household food security may incorporate elements such as food shortages, fear of food shortages, perceptions about the quality or quantity of food eaten, and how people deal with food shortages. The nutritional quality of diets and safety of food are other elements. Access to health, sanitation, and other services also affect a household's food security situation (FAO, 2000).

11.271. Various approaches have been used to measure household food security. Some countries have developed a household food security scale, which provides an overall assessment of where each household is on the spectrum between being food insecure and food secure, based on a series of food security related questions. Other countries undertake in-depth surveys exploring all the different elements of household food security.

11.272. It is not possible to fully cover household food security in an agricultural census, and it is difficult to make specific recommendations on which household food security items each country should include in its agricultural census. Some guidelines are provided in the paragraphs below.

11.273. Any survey involving a complex topic such as this will need extensive questionnaire development and testing. The concept of "food shortage" could be approached in different ways, such as asking about "getting enough food every day", "facing food shortages", or "not having enough money to buy food". Food shortages may be reflected in various ways such as skipping meals, eating less expensive food, or cutting the size of meals.

11.274. It is recommended that food security not be included in the core agricultural census module. For the household food security supplementary module, two broad food security indicators are proposed: (i) food shortages faced in a twelve month reference period; and (ii) fear of a food shortage in the coming twelve months. Additional items on the types of food normally eaten, anthropometric data, and the effects of natural disasters are also proposed.

Supplementary items

0901(a) WHETHER HOUSEHOLD MEMBERS COULD NOT AFFORD TO EAT WHAT THEY NORMALLY EAT AT ANY TIME DURING A TWELVE-MONTH REFERENCE PERIOD (for the household)

0901(b) MONTHS IN WHICH FOOD SHORTAGE OCCURRED (for the household)

0901(c) REASONS FOR FOOD SHORTAGE (for the household)

0901(d) HOW THE HOUSEHOLD'S EATING PATTERNS WERE AFFECTED BY FOOD SHORTAGE (for the household)

0901(e) STEPS TAKEN TO ALLEVIATE FOOD SHORTAGE (for the household)

11.275. Item 0901 relates to food shortages faced by the household during a previous twelve-month

reference period. This takes account of seasonality in food supplies. The census reference year is usually suitable. If seasonality is not important, a shorter reference period, such as one month, may be used.

11.276. Could not afford to eat what they normally eat refers to the situation where the household finds that it is unable to maintain its normal eating patterns at any time during the reference period and is forced to make changes such as skipping meals, eating less for each meal, or eating cheaper and perhaps less nutritious food. This item relates to what the household normally eats, even if the household's normal diet is inadequate in terms of the amount of food eaten or how balanced the diet is.

11.277. Data on months in which food shortage occurred are useful to assess the seasonality of food shortages, such as before the main harvest or where natural calamities are common. A household may experience a food shortage in one or more months of the year and respondents should show each month in which the shortage occurred. For some countries, this information could be collected in terms of the frequency of food shortages, rather than months in which food was short. Here, terminology such as: "1 or 2 months of the year" and "some months of the year", or "sometimes" and "often" may be used.

11.278. Reasons for food shortage will depend on local conditions. Food shortages may be caused by exceptional events such as loss of crops, or they may be attributed to more long-term factors such as lack of land. Respondents may have more than one reason for a food shortage. Countries should develop suitable response categories for reporting these data. Some typical response categories are:

- *Loss of crops*
- *Lack of jobs*
- *Inability to work because of illness or injury*
- *Disabled, old age*
- *Lack of land*
- *Lack of capital*
- *Family too big*

11.279. Eating patterns affected by food shortage refers to the household's immediate response to the food shortage. Typical response categories are:

- *Skipping meals*
- *Eating less expensive food*
- *Cutting the size of meals*

11.280. Steps taken to alleviate food shortage refers to what the household did to try and overcome the food shortage. This will depend on national conditions but could include the following response categories:

- *Use savings to buy food*
- *Take out a loan*
- *Sell land or livestock*
- *Get another job*
- *Start or expand a family business*
- *Get help from relatives or other people*
- *Get help from the Government*
- *Get help from charities*

0902 WHETHER THE HOUSEHOLD FEARS A FOOD SHORTAGE DURING A FUTURE TWELVE-MONTH REFERENCE PERIOD (for the household)

11.281. Item 0902 relates to fears of a food shortage during a coming twelve-month reference period, such as the next agricultural year.

11.282. Fears a food shortage refers to the household's fear of getting into a food shortage situation at any time during the reference period because of the threat of natural disaster, loss of crops, loss of a job,

or other factors. The fear of food shortage relates to the household's own assessment of their food security situation for the coming year.

0903 FREQUENCY OF NORMALLY EATING SELECTED FOOD PRODUCTS (for the household)

11.283. This item provides information on the frequency of eating key food products. It can help to understand how diets change in the face of a food shortage or vulnerability to food shortage. The food products specified will vary from country to country and should focus on the food groups that best discriminate food insecurity. Thus, if households tend to respond to a food shortage by eating more maize and vegetables and less rice and meat, these food groups should be emphasized in Item 0903. It is not necessary to cover all food groups.

11.284. Data on food frequency should be collected for a relatively short reference period, such as a week or a month. The frequency can be reported in terms of categories such as: every day; often; sometimes; not at all.

0904 EFFECTS OF NATURAL DISASTERS (for the household)

0905 EXTENT OF LOSS OF AGRICULTURAL OUTPUT DUE TO NATURAL DISASTERS (for the household)

11.285. Items 0904 and 0905 are suitable for countries where natural disasters are prevalent and, when they occur, can have a major impact on the food security situation of the people affected. Normally, the census reference year is taken as the time reference.

11.286. Item 0904 refers to whether the household's food security situation was affected by specified natural disasters. For the purposes of the agricultural census, natural disasters include the major climatic and physical events, as well as major pest attacks. The types of natural disasters identified will depend on national circumstances. The following response categories may be suitable:

- *Floods or tidal waves*
- *Drought*
- *Typhoons or hurricanes*
- *Pests*
- *Other*

11.287. A household may have suffered because of more than one disaster and should be reported accordingly.

11.288. Item 0905 covers the extent of the loss as a result of the disasters reported in Item 0904. The extent of the loss of agricultural output should be measured according to suitable criteria, such as:

- *None*
- *Slight*
- *Moderate*
- *Severe*

11.289. Normally, Item 0905 relates to the overall effect of the natural disasters, not the effects of specific disasters or the effects on specific crops or livestock. For crops, loss is usually assessed in terms of the effect on crop production in comparison with a normal year, such as: slight – less than 20 percent lower; moderate – 20–40% lower; severe – more than 40% lower. Similar criteria can be used for livestock.

0911 HEIGHT AND WEIGHT (for children aged under 5 years)

11.290. The outcome of food insecurity is that people do not eat enough food and, for children, this is reflected in their growth. Data on the heights and weights of children aged under five years can be valuable in assessing the effect of household food security problems. By relating the height and weight

of a child to his/her age, one can measure the following indicators:

- Underweight; that is, the child's weight is too low for his/her age. Children may also be classified as moderately or severely underweight.
- Stunting; that is, the child's height is too low for his/her age. Children may also be classified as moderately or severely stunted.
- Wasting; that is, the child's weight is too low for his/her height.

11.291. To collect these data, enumerators need to be provided with measuring instruments; namely, a measuring tape to record heights and scales to record weights.

Theme 10: Aquaculture

Core items

0014 PRESENCE OF AQUACULTURE ON THE HOLDING

11.292. For the purpose of the agricultural census, presence of aquaculture refers to aquacultural production activities carried out in association with agricultural production. This means that the aquacultural activities are integrated with agricultural production, such as in rice-cum-fish culture, or that aquaculture and agriculture share the same inputs, such as machinery and labour. For more information on the treatment of aquaculture in the context of the national accounting framework, see Appendix 1. Aquaculture carried out independently of agricultural production is not included; for example, a household may have independently managed and operated agricultural and aquacultural activities.

11.293. Aquaculture is the farming of aquatic organisms such as fish, crustaceans, molluscs and plants. In this context, farming refers to some intervention in the rearing process to enhance production, such as regular stocking, feeding and protection from predators. Aquaculture normally involves rearing of organisms from fry, spat or juveniles. Aquaculture may be carried out in ponds, paddy fields, lagoons, estuaries, irrigation canals or the sea, using structures such as cages and tanks. It may be in freshwater or saltwater.

11.294. A distinction must be made between aquaculture and other forms of aquatic exploitation such as capture fisheries. Capture fisheries involve catching aquatic animals or gathering aquatic plants "in the wild". An important characteristic of capture fisheries is that the aquatic organisms being exploited are common property, as opposed to being owned by the holding as is the case for aquaculture.

11.295. The boundary between aquaculture and capture fisheries may be blurred. Where fish are caught in the wild and fattened up for sale, the fattening process should be considered as aquaculture. Limited enhancement actions taken to increase fish production, such as modifications to the aquatic habitat, should not be considered as aquaculture.

11.296. Data on aquaculture usually relate to activities carried out over a twelve-month period, usually the census reference year.

Supplementary items

1001 AREA OF AQUACULTURE ACCORDING TO TYPE OF SITE (for the holding)

- *Land-based*
 - *Arable land*
 - *Non-arable land*
- *Inland open water*
- *Coastal and marine waters*

11.297. Area of aquaculture refers to the area of land under water used for aquaculture. This means the

surface area of the pond, paddy field, lagoon, estuary, irrigation canal, or the sea used for aquaculture. The area figure should include supporting structures such as pond banks and floating structures of cages. The area of land-based aquaculture-related facilities such as hatcheries, storage buildings, fish processing facilities, laboratories and offices, should not be included. The area should include land owned by the holding as well as bodies of water rented from others for use for aquacultural purposes. Such bodies of water could include parts of rivers, lakes, reservoirs, dams, canals, lagoons/estuaries, bays/coves, or the open sea. The aquacultural area should refer to the area of the aquacultural facility on the body of water – for example, the total area of the pen or cage network in the water. Some holdings may have very small area of aquaculture.

11.298. Land-based aquaculture is aquaculture practised in rice fields, ponds, tanks, raceways and other land areas on the holding. Countries may need to develop procedures to distinguish between land-based and open water aquaculture for some water bodies such as ponds. The split into arable and non-arable land is intended to determine what part of the land-based aquaculture is practised on land that is also used for crop production. Examples of non-arable land are saline-alkaline lands and wetlands. Refer to paragraph 11.38 for the definition of arable land.

11.299. Inland open water includes dams, reservoirs, lakes and rivers. Coastal and marine waters include lagoons, estuaries, shallow and open seas, bays and coves, including inter-tidal mudflats.

11.300. The reference period for data on area of aquaculture is the census reference year.

1002 AREA OF AQUACULTURE ACCORDING TO TYPE OF PRODUCTION FACILITY (for the holding)

- *Rice-cum-fish culture*
- *Ponds*
- *Pens, cages and hapas*
- *Tanks and raceways*
- *Floating rafts, lines, ropes, bags and stakes*

11.301. Rice-cum-fish culture is the use of land for the culture of both rice and aquatic organisms. One form of rice-cum-fish culture is the introduction of brood-stock or seed into flooded paddy fields, often modified for aquacultural purposes. Another form of rice-cum-fish culture is where rice and fish are raised on the same land in different seasons. Fishing associated with fish from the wild that enter paddy fields during flooding is not included.

11.302. Pond culture is the breeding or rearing of aquatic plants or animals in natural or artificial enclosures. Pond culture is usually carried out in stagnant waters with periodic water exchange or water flushing through inlets and outlets. Sometimes, large ponds are used in association with cages or hapas. Often there is some integration between crops, livestock and pond culture, as in fish-cum-vegetable culture or fish-cum-animal husbandry.

11.303. Pens, cages and hapas are net enclosures used for rearing aquatic animals or plants in lakes, rivers, reservoirs or the open sea. Pens are fixed by frameworks made of metal, plastic, bamboo or wood. Cages are held in place by floating structures. Hapas are simple net enclosures suspended by stakes in the four corners in open water bodies.

11.304. Tanks and raceways are fixed structures used for raising aquatic animals or plants. They are normally built above ground and can be made of bricks, concrete or plastic. Tanks are small round or rectangular structures, whereas raceways are long, narrow structures.

11.305. Floating rafts, lines, ropes, bags and stakes refer to the aquacultural practice based on these facilities, commonly used for the cultivation of shellfish and seaweed.

11.306. The reference period for data on area of aquaculture is the census reference year.

1003 TYPE OF WATER (for the holding)

- Freshwater
- Brackish water
- Saltwater

11.307. This item refers to whether aquaculture on the holding was carried out during the reference year using water of the above types. There may be more than one type of water used on a holding. The type of water is usually closely related to the type of site in Item 1001.

11.308. Freshwater refers to reservoirs, rivers, lakes and canals, with consistently negligible salinity. Brackish water refers to waters with appreciable salinity but not to a constant high level. It is characterized by fluctuations in salinity due to regular influxes of freshwater and seawater, such as in estuaries, coves, bays and fjords. Enclosed water bodies in which salinity is greater than freshwater but less than seawater are also regarded as brackish. Saltwater (or marine water) refers to coastal and offshore waters where salinity is high and is not subject to significant daily or seasonal variation.

1004 SOURCES OF WATER FOR AQUACULTURE (for the holding)

- Rain-fed
- Groundwater
- Rivers/canals
- Lakes/reservoirs
- Dams
- Estuaries/lagoons
- Coves/bays/sea

11.309. This item refers to whether water for aquacultural production on the holding during the census reference year was obtained from the above sources. There may be more than one source of water used for aquaculture on a holding. The source of water is usually closely related to the type of site in Item 1001. Countries may wish to adapt these categories to suit local conditions.

1005 TYPE OF AQUACULTURAL ORGANISM CULTIVATED (for the holding)

- Freshwater fish
- Diadromous fish
- Marine fish
- Crustaceans
- Molluscs
- Other aquatic animals
- Aquatic plants

11.310. This item refers to which of the above types of aquatic organisms were cultivated on the holding during the census reference year. More than one type of organism may be cultivated on a holding. The classification refers to the type of aquatic animal or plant cultivated, not the type of aquacultural product generated. Thus, pearl production is shown under "Molluscs".

11.311. The main types of freshwater fish are carps and tilapias. Diadromous fish are fish that can live in both fresh and seawater, such as trout, salmon, eels and sturgeon. Marine fish include flounder, cod and tuna. Crustaceans are aquatic animals with hard shells, such as crabs, lobsters and shrimps. Molluscs are animals belonging to the phylum Mollusca, including abalones, oysters, mussels, scallops, clams and squids. Other aquatic animals include frogs, crocodiles, alligators, turtles, sea-squirts and sea urchins. Aquatic plants include seaweed and lotus.

Theme 11: Forestry

Core items

0015 PRESENCE OF FOREST AND OTHER WOODED LAND ON THE HOLDING

11.312. Presence of forest and other wooded land refers to whether such forest and other wooded areas are present on the land making up the agricultural holding. Refer to paragraphs 11.35–11.36 for the definition of forest and other wooded land. The reference period is the day of enumeration.

11.313. Often, holdings with forest and other wooded land are identified from holdings with land use “forest and other wooded land” in Item 0007. This is based on the concept of main use of the land. Some holdings have land not classified to land use “forest and other wooded land” that contains groups of forest trees or other wooded plants satisfying the criteria for “forest and other wooded land” in terms of tree height and crown cover. For example, “land under permanent meadows and pastures” may also contain forest trees and other wooded plants more than five metres in height with crown cover of more than 10%. To identify all holdings with forest and other wooded land, data on secondary land use are needed.

Supplementary items

1101 AREA OF FOREST AND OTHER WOODED LAND AS PRIMARY LAND USE (for the holding)

- Forest
- Other wooded land

11.314. The total area of forest and other wooded land as a primary land use is given in the land use classification in Item 0007. Item 1101 sub-divides this total into its two components.

1102 AREA OF FOREST AND OTHER WOODED LAND AS A SECONDARY LAND USE ON AGRICULTURAL LAND (for the holding)

- Forest
- Other wooded land

11.315. Area of forest and other wooded land as a secondary land use on agricultural land is the area of agricultural land with forestry and other wooded land as a secondary land use. Agricultural land covers arable land, land under permanent crops and permanent meadows and pastures (see paragraph 11.38). The reference period is the day of enumeration.

1103 MAIN PURPOSE OF FOREST AND OTHER WOODED LAND (for the holding)

- Production
- Soil and water protection
- Multiple use
- Other

11.316. This item relates to all forest and other wooded land on the holding, including forest and other wooded land as a secondary land use on agricultural land (see Item 1102). Main purpose is assessed in relation to an extended period, usually the census reference year.

11.317. Production refers to the production and extraction of forest goods, including both wood and non-wood forest products such as oils, leaves and bark. Other includes forest/other wooded land with no specific function.

1104 WHETHER AGRO-FORESTRY IS PRACTISED (for the holding)

11.318. Agro-forestry is a sustainable farm management system in which trees and other wooded plants are purposely grown on the same land as agricultural crops or livestock, either concurrently or in rotation. Agro-forestry is characterized by the existence of both ecological and economic interactions between the different components. Agro-forestry includes agrosilvicultural (trees and crops), silvopastoral (trees and livestock), and agrosilvipastoral (trees, crops and livestock) systems.

11.319. Agro-forestry refers to specific forestry practices that complement agricultural activities, such as by improving soil fertility, reducing soil erosion, improving watershed management, or providing shade and food for livestock. Just growing trees on agricultural land is not considered agro-forestry. Countries need to develop their own procedures to collect these data. Some may wish to collect data on specific agro-forestry activities. The reference period for agro-forestry data is the census reference year.

12. Management of the holding

Supplementary items

1201 IDENTIFICATION OF SUB-HOLDINGS (for the holding)

1202 IDENTIFICATION OF SUB-HOLDERS (for the holding)

11.320. A sub-holding is a group of agricultural activities on the holding managed by a particular person in the holder's household. A sub-holder is a person responsible for managing a sub-holding. Refer to paragraphs 3.42–3.52 for the definitions of sub-holder and sub-holding and a discussion of data collection issues for these items.

1211 SEX OF SUB-HOLDER (for each sub-holding)

1212 AGE OF SUB-HOLDER (for each sub-holding)

11.321. A census supplementary module on management of the holding usually includes data on demographic and social characteristics of household members (Theme 07) and economic activity of household members (Theme 08). Once the sub-holder is identified, he/she can be linked to the Theme 07 items to provide information on his/her characteristics, especially sex (Item 0711) and age (Item 0712).

11.322. Data on other characteristics of the sub-holder are usually also available from the Theme 07 and Theme 08 items, and may be useful for agricultural census analysis. This includes: relationship to household head (Item 0713); marital status (Item 0714); educational attainment (Item 0715); activity status (Item 0801); status in employment of main job (Item 0811); occupation of main job (Item 0812); time worked in main job (Item 0813); and time worked on the holding (Item 0814).

1213 AREA OF CROPS MANAGED FOR EACH CROP GROUP (for each sub-holding)

1214 NUMBER OF LIVESTOCK MANAGED FOR EACH LIVESTOCK GROUP (for each sub-holding)

11.323. Area of crops managed refers to the area of the particular crop group under the control of the sub-holder. This relates to that part of the crop area in Item 0301 (temporary crops) and Item 0311 (permanent crops) that is under the control of the sub-holder. This refers to the area harvested during the reference year for temporary crops, or the current area for permanent crops.

11.324. Crops should be categorized into several groups suitable to national conditions, based on the crop classification given in Appendix 3. One possible grouping is:

- Grain crops
- Vegetable crops

- *Other temporary crops*
- *Permanent crops*

11.325. Number of livestock managed refers to the number of livestock managed by the sub-holder. This relates to those livestock in Item 0013 that are under the control of the sub-holder. This usually refers to the livestock numbers on the day of enumeration.

11.326. For reporting of Item 1214, livestock should be suitably grouped, based on the livestock classification in Appendix 5. One possible grouping is:

- *Large ruminants and equines*
- *Other animals*
- *Poultry*
- *Other*

11.327. The method of collecting crop and livestock data for sub-holdings and sub-holders will depend on local conditions and the existing data collection methodology for crops and livestock. One method for crops is to identify all the plots of land making up the sub-holding, and collect data on the area of crops harvested for each plot. This approach may be suitable where countries already collect crop data at the plot level; otherwise, it may add complexity to the data collection operation.

11.328. Usually, it is better to collect the sub-holding/sub-holder data separately from the main crop and livestock data, by asking specific questions about the type of crop and livestock activities carried out under the control of the sub-holder. The crop and livestock data can be reported in broad groups as shown in paragraphs 11.324 and 11.325.

CHAPTER 12

AGRICULTURAL CENSUS TABULATION PROGRAMME

To be useful, data collected in an agricultural census must be presented in aggregated form, especially in statistical tables. This chapter presents the recommended tables for the agricultural census. The chapter is divided into three parts. Part A considers the tabulation programme for the collection of holding-level data. The most important census classification items are identified and proposed cross-tabulations for the core and supplementary census modules are presented. Part B discusses the tabulation programme for the community survey, including the presentation of community summaries and cross-tabulations of holding- and community-level data. Part C discusses the tabulation programme for the census of agriculture and aquaculture.

Introduction

12.1. Data collected in an agricultural census are only of statistical interest if they can be presented in aggregated form. This means that the data collected for each holding must be aggregated to provide totals, such as the number of cattle in a given province or the number of holdings in the country growing cassava. In a community survey, aggregate results such as the percentage of communities with seasonal food shortages are produced. The primary form of presentation of statistical data is a statistical table. The tabulation programme for an agricultural census is the set of statistical tables prepared to present the census results.

12.2. The tabulation programme for an agricultural census must be determined before designing the census questionnaires; otherwise, one may find out after the data collection that the data collected do not meet the requirements for the tabulation programme. Also, the tabulation programme may have direct implications for the census design; for example, the level of administrative units to be presented in the tables could be a decisive factor in choosing between complete or sample enumeration, or in deciding what sample size is needed.

12.3. Statistical tables present different types of summarized measures:

- Totals for items collected, such as the total area of sugar cane harvested.
- Total number of units with certain characteristics, such as the number of holdings with pigs.
- Averages for items, such as the average area of holding.
- Percentages, such as the percentage of holdings using organic fertilizers or the percentage of communities with electricity connected.

12.4. A feature of statistical tables is that they provide data classified according to various characteristics. For example, one may wish to know the average household size for different farm sizes, or the percentage of holdings using organic fertilizers for holders of different ages. Here, “area of holding” and “age of holder” are the classification items. In most censuses and surveys, there are some main classification items used in many tables. Often, classification items need to be formed into suitable classes for presentation in the tables. Thus, in the above example, age of holder needs to be divided into suitable age groupings and area of holding into suitable area groupings.

12.5. Often, cross-tabulations are prepared showing census data classified by two different items simultaneously. An example of a cross-tabulation is a table showing the number of holdings classified by age of holder and area of holding. This would be a two-way table showing the number of holdings in each age/area class; for example, one cell of the table would show the number of holdings for which: (i) age of holder is in the range 20–29 years; and (ii) area of holding is in the range 1.00–1.99 ha.

12.6. An important element in preparing the agricultural census tabulation programme is deciding on the tabulation classes. Often, there are international standards, and countries should adhere to those wherever possible to help make comparisons between countries. Attention should also be given to consistency between statistical collections in the country; for example, it would be difficult to relate data if age groups 0–9, 10–19, etc. were used in one collection and 0–10, 11–20, etc. in another. Recommended classifications for use in the agricultural census tabulation programme are presented in this chapter. Where countries wish to use different class groupings, they should also report the results according to the standards given here.

Part A: Core and supplementary modules

Core items to be tabulated

12.7. The tabulation classes and reference group for each core item are summarized in Figure 12.1. The reference group refers to the group of holdings to be tabulated for the item; for example, the item “area irrigated” is only meaningful for land holdings. There is more than one way to tabulate some items; for number of livestock, for example, holdings can be tabulated according to whether they have each type of livestock or to the number of a particular type of livestock they have.

Main classification items

12.8. Nine main classification items from the core module have been identified for tabulations of the core and supplementary modules. The nine items are discussed in the following paragraphs. Reference is made to the item numbers in Figure 12.1.

12.9. Administrative or agro-ecological zone (Item 0001). The sub-division of census data into administrative or agro-ecological zones is one of the key tabulation requirements.

12.10. Legal status of holder (Item 0002). This provides a basis for comparative analysis of holdings operated by households, cooperatives, corporations, etc.

12.11. Area of holding (Item 0008). Area of holding is the most widely used classification item for agricultural census tables as it usually provides a good measure of size of holding, particularly for regions with homogeneous land. Area of holding may have limitations as a size measure. It may include forest, woodland or other land not used for agricultural purposes. It also disregards land quality; for example, non-irrigated land in an arid or semi-arid region may be much less productive than irrigated land elsewhere, and land at high altitudes may have an entirely different productive capacity from the same land area at a lower level. The area of holding measure also neglects land use intensity: one piece of land may produce two or more crops per year, whereas for another, a crop may be produced only every two or three years.

12.12. Area of agricultural land (Item 0007a). This may be a more suitable size measure for some purposes as it directly measures the land used mainly for crop production. Other land measures, such as area of permanent crops, may also be useful classification items.

12.13. Number of livestock (for a particular livestock type) (Items 0013a–0013f). The number of livestock of a particular type is a suitable measure of the size of livestock activity where there is one predominant kind of livestock in the country and where livestock raising is a major activity. For example, in an important sheep raising country, it may be useful to classify agricultural census data according to classes based on the number of sheep, such as 1–4 head, 5–9 head, etc. Normally, it is only possible to classify agricultural census data on the basis of a particular type of livestock, rather than for all livestock or groupings of livestock types, as it is difficult to meaningfully group livestock of different types. Sometimes, groupings such as “large animals”, “small animals” and “poultry” can be used to describe cattle/buffaloes, sheep/goats/pigs, and chickens/ducks, respectively.

12.14. Main purpose of production (Item 0006). Purpose of production is a useful measure in analyzing holdings according to their access to markets.

Figure 12.1: Agricultural census core module – tabulation classes

Core census item		Tabulation classes	Reference group
0001	Administrative or agro-ecological zone	Based on national groupings	All holdings
0002	Legal status of holder	Household sector <i>Multiple-holding household</i> <i>Single-holding household</i> <i>Partnership of two or more households</i> Non-household sector <i>Corporation</i> <i>Cooperative</i> <i>Government</i> <i>Other</i>	All holdings
0003	Sex of holder	Holder is an individual <i>Male</i> <i>Female</i> More than one co-holder <i>Co-holders are male only</i> <i>Co-holders are female only</i> <i>Co-holders are both male and female</i>	Holdings in sector "single-holding household"
0004	Age of holder	Holder is an individual <i>Under 25 years</i> <i>25 – 34 years</i> <i>35 – 44 years</i> <i>45 – 54 years</i> <i>55 – 64 years</i> <i>65 years and over</i> More than one co-holder	Holdings in sector "single-holding household"
0005	Household size	1 person 2 – 3 persons 4 – 5 persons 6 – 9 persons 10 persons and over	Holdings in sector "single-holding household"
0006	Main purpose of production	Producing mainly for home consumption Producing mainly for sale	Holdings in sector "single-holding household"
0007	Land use	Agricultural land <i>Cropland</i> ▪ Arable land - Land under temporary crops - Land under temporary meadows - Land temporarily fallow ▪ Land under permanent crops <i>Permanent meadows and pastures</i> Forest and other wooded land Other land	All holdings
0007a	Area of agricultural land	Holdings without agricultural land Holdings with agricultural land <i>(Area groupings as for area of holding)</i>	All holdings
0008	Area of holding	Holdings without land Holdings with land <i>Less than 0.1 ha</i> <i>0.1 – 0.19 ha</i> <i>0.2 – 0.49 ha</i> <i>0.5 – 0.99 ha</i> <i>1 – 1.99 ha</i> <i>2 – 2.99 ha</i> <i>3 – 3.99 ha</i> <i>4 – 4.99 ha</i> <i>5 – 9.99 ha</i> <i>10 – 19.99 ha</i>	All holdings

Figure 12.1 (cont.): Agricultural census core module – tabulation classes

Core census item	Tabulation classes	Reference group
0008 Area of holding (cont.)	20 – 49.99 ha 50 – 99 ha 100 – 199 ha 200 – 499 ha 500 – 999 ha 1,000 – 2,499 ha 2,500 ha and over	
0009 Land tenure	Holdings without land Holdings operated under one tenure form <i>Legal ownership or owner-like possession</i> <i>Non-legal ownership or owner-like possession</i> <i>Rented from others</i> <i>Other</i> Holdings operated under two or more tenure forms <i>Legal ownership or owner-like possession</i> <i>Non-legal ownership or owner-like possession</i> <i>Rented from others</i> <i>Other</i>	All holdings
0010 Area irrigated	Holdings without irrigated land Holdings with irrigated land (<i>Area groupings as for area of holding</i>)	Holdings with land
0011 Temporary crops	Based on crop classification in Appendix 3	Holdings with land
0012 Permanent crops	Based on crop classification in Appendix 3 Also classified by: <i>Compact plantation is present</i> <i>Compact plantation is not present</i>	Holdings with land
0013 Livestock numbers	Based on livestock classification in Appendix 5	All holdings
0013a Number of cattle	Holdings with no cattle Holdings with cattle 1 – 2 head 3 – 4 head 5 – 9 head 10 – 19 head 20 – 49 head 50 – 99 head 100 – 199 head 200 – 499 head 500 head and over	All holdings
0013b Number of buffaloes	Same as for "Number of cattle"	All holdings
0013c Number of sheep	Holdings with no sheep Holdings with sheep 1 – 4 head 5 – 9 head 10 – 19 head 20 – 49 head 50 – 99 head 100 – 199 head 200 – 499 head 500 head and over	
0013d Number of goats	Same as for "Number of sheep"	All holdings
0013e Number of pigs	Same as for "Number of sheep"	All holdings
0013f Number of poultry	Holdings with no poultry Holdings with poultry 1 – 9 poultry 10 – 49 poultry 50 – 99 poultry 100 – 199 poultry	All holdings

Figure 12.1 (cont.): Agricultural census core module – tabulation classes

Core census item	Tabulation classes	Reference group
0013f Number of poultry (cont.)	200 – 499 poultry 500 – 999 poultry 1,000 – 4,999 poultry 5,000 – 9,999 poultry 10,000 poultry or more	
0014 Aquaculture	Aquaculture is present Aquaculture is not present	All holdings
0015 Forest and other land	Forest and other wooded land is present Forest and other wooded land is not present	Holdings with land
0016 Other economic activities	Other agricultural production Agricultural services Hunting/trapping/game propagation/related services Forestry, logging and related service activities Fishing, aquaculture and related service activities Manufacturing Wholesale and retail trade Hotels and restaurants Other	All holdings

12.15. Household size (Item 0005). Household size is a useful classification item for understanding the dependence of rural people on land and for evaluating household members as a source of labour for the holding. For tabulating on household size, some countries may wish to use equivalence scales, which take into account the demographic characteristics of households. For more information, see *Expert Group on Household Income Statistics; Final Report and Recommendations* (Canberra Group, 2001, pp. 40–41).

12.16. Sex of holder (Item 0003). Sex of holder is a useful measure in analyzing the role of women in agriculture and the disadvantages they face. Tabulating sex of holder is complicated by the existence of holders consisting of more than one person.

12.17. Age of holder (Item 0004). This classification item provides a way of making comparisons between young and old farmers, and studying the effects of emigration from rural areas. Tabulating age of holder is complicated by the existence of holders consisting of more than one person.

12.18. If a community survey is carried out as part of the agricultural census, consideration should also be given to using community-level data as classification items for tabulations in the core and supplementary modules. This is discussed in paragraphs 12.34–12.37.

Core module: cross-tabulations

12.19. There are thousands of possible tables that could be produced from a typical agricultural census, even for a core module with only a limited number of items. Each core item could be cross-tabulated against each main classification item or even several main classification items at the same time. For example, the presence of aquaculture could be tabulated by administrative zone to analyse the geographical distribution of aquaculture, or by area of holding to analyse the relationship between aquaculture and farm size. Alternatively, the presence of aquaculture could be tabulated by administrative zone and area of holding together to analyse the relationship between aquaculture and farm size in different parts of the country.

12.20. Generating a statistical table from an agricultural census requires specialist technical inputs, and countries must have a realistic census tabulation programme, taking into consideration the resources available and the importance of the information in each table. For example, tabulating area of holding by age of holder may be important, but is it necessary to tabulate type of permanent crop by age of holder? Countries should be cautious of classifying data too finely in cross-tabulations, because table cells may

be based on only one or two holdings, which may breach confidentiality. Also, if the core census module is carried out on a sample basis, census estimates based on few sample holdings will have unacceptably high sampling errors.

12.21. The most common cross-tabulations for the core census module are summarized in Figure 12.2. The rows of Figure 12.2 show the core items to be tabulated. The columns show the nine main classification items given in paragraphs 12.9–12.17. Classification items appear in both the rows and columns. The body of Figure 12.2 shows the characteristic being measured in the cross-tabulation; in particular: N = Number of holdings; A = Area; L = Number of livestock.

Figure 12.2: Agricultural census core module: recommended cross-tabulations

Core item		Main classification item								
		Admin./ecological zone	Legal status of holder	Area of holding	Area of agricultural land	No. of livestock	Purpose of production	Household size	Sex of holder	Age of holder
0001	Location of agricultural holding	..								
0002	Legal status	N,A	..	N						
0003	Sex of holder	N							..	
0004	Age of holder	N								..
0005	Household size						..			
0006	Main purpose of production	N		N		..	N			
0007	Land use type	N,A	N	N	..	N				
0008	Area of holding	N,A		..			N,A	N	N	
0009	Land tenure type	N		N						
0010	Irrigation	N		N	N		N	N	N	
0011	Temporary crops	N	N	N	N		N			
0012	Permanent crops	N	N	N	N		N			
0013	Livestock numbers	N,L		N		N	N			
0014	Aquaculture	N		N						
0015	Forest and other wooded land	N		N						
0016	Other economic activities			N			N			

N = Number of holdings; A = Area; L = Number of livestock.

12.22. The following example illustrates the use of Figure 12.2. Item “area of holding” (row) is shown as being classified against classification item “household size” (column) with the characteristics “number of holdings” and “area”. This means that two tables should be prepared: one showing the number of holdings for each area of holding and household size class as given in paragraphs 12.11 and 12.15; and the other showing the area of holding for each area of holding and household size class.

12.23. Where “number of holdings” is being tabulated, the table cells may or may not be mutually exclusive. An example of mutually exclusive classes is where number of holdings is classified by household size; here, each holding can only belong to one household size class. An example of a table where classes are not mutually exclusive is where number of holdings is classified by land use; here, a

given holding can be shown more than once in the land use classification – for example, a holding may have land under permanent crops, as well as forest and other wooded land.

12.24. The tabulation programme in Figure 12.2 will not necessarily meet all data needs for the core census module. Countries should prepare additional tables as needed.

Supplementary modules: cross-tabulations

12.25. The nine main classification items for the tabulation of the core census module, given in paragraphs 12.9–12.17, should also be used as the basis for the tabulation programme for the census supplementary modules. This is made possible by the use of the core census module to provide sampling frames for the census supplementary modules. Thus, data for a particular holding from a census supplementary module can be linked to data for the same holding from the core census module. For example, in a supplementary aquacultural module, aquacultural data could be cross-tabulated against core items like area of holding and household size.

12.26. Cross-tabulations may also be prepared for each census supplementary module using classification items from the supplementary module itself. For example, in a supplementary aquacultural module, the data collected could be tabulated against area of aquaculture.

12.27. The list of items recommended for the census supplementary modules is extensive and it is not possible in this volume to provide an exhaustive tabulation programme for each module and each item. Many different types of tables can be prepared, depending on the module. Tables can be based on different units, such as holdings, parcels, or household members. Tables may also measure different characteristics; for example, a crop supplementary could show crop data in terms of the “number of holdings growing a specific crop” or the “area of the crop harvested”. Some items need to be aggregated to the holding level for tabulation purposes; for example “presence of shifting cultivation” on the holding would need to be derived from the shifting cultivation data collected for each parcel.

12.28. Instead of providing specific table recommendations for each item of each module, a summary of the core classification items relevant to items under each of the 12 census supplementary themes is given. This is shown in Figure 12.3. The rows show the 12 supplementary themes. The columns show the nine main classification items given in paragraphs 12.9–12.17. The interpretation of Figure 12.3 is illustrated in the following example. Four main classification items (administrative zone, legal status of holder, area of holding, and household size) are shown as being relevant to the theme “irrigation and water management”. This means that any item under the heading “irrigation and water management”, such as area irrigated, should be suitable for tabulating against these classification items.

12.29. A guide to the census supplementary cross-tabulations involving data from the supplementary modules themselves is given in Figure 12.4. This lists the main classification items for each supplementary module. For example, “area irrigated” is shown as a classification item for the module “irrigation and water management”. This means that “area irrigated” should be a suitable classification item for tabulating items in the “irrigation and water management” module.

Part B: Community-level data

12.30. Community-level data in an agricultural census can be tabulated in two ways: first, to summarize the characteristics of communities; and second, to use as classification items for tabulations of census holding-level data in the core and supplementary modules.

12.31. Some community-level data need to be formed into suitable groupings for tabulation purposes. This particularly applies to data on travelling time, where suitable groupings – for example: less than 1 hour; 1–2 hours; 2 hours or more – should be used to reflect how easy it is for people in the community to access a specific service.

Figure 12.3: Agricultural census supplementary modules: cross-tabulations with core items

Theme	Main classification item								
	Admin./ecological zone	Legal status of holder	Area of holding	Area of agricultural land	No. of livestock	Purpose of production	Household size	Sex of holder	Age of holder
0001 Land	✓	✓	✓				✓		
0002 Irrigation and water management	✓	✓	✓				✓		
0003 Crops	✓	✓				✓	✓		
0004 Livestock	✓	✓	✓			✓	✓		
0005 Agricultural practices	✓	✓	✓			✓		✓	✓
0006 Agricultural services	✓	✓	✓			✓		✓	✓
0007 Demographic and social characteristics			✓		✓				
0008 Farm labour	✓		✓				✓	✓	✓
0009 Household food security	✓		✓	✓	✓	✓	✓	✓	✓
0010 Aquaculture	✓		✓						
0011 Forestry	✓		✓						
0012 Management of the holding	✓		✓	✓	✓		✓	✓	✓

Figure 12.4: Agricultural census supplementary modules: main classification items in each module

Theme	Main classification items
0001 Land	Area of parcel (for parcel tabulations).
0002 Irrigation and water management	Area irrigated.
0003 Crops	Area of crop harvested (for specific crop tabulations).
0004 Livestock	Number of animals by type (for livestock type tabulations).
0005 Agricultural practices	
0006 Agricultural services	
0007 Demographic and social characteristics	Sex and age (for household members tabulations).
0008 Farm labour	Sex and age.
0009 Household food security	
0010 Aquaculture	Area of aquaculture.
0011 Forestry	Area of forest and other wooded land.
0012 Management of the holding	Sex of sub-holder; age of sub-holder.

Summary characteristics of communities

12.32. The primary tabulation requirement is for data on the number, or percentage, of communities with specific community characteristics, such as electricity, seasonal food shortages, or exposure to natural disasters. Tabulations may also be prepared showing the number of households or population with certain community characteristics.

12.33. Tabulations mainly involve classifying community-level data by administrative or agro-ecological zone. Other classification items may also be useful, depending on the data collected:

- Economic status, if available, may be able to be used to classify communities as “rich” or “poor”. A tabulation of the percentage of communities prone to natural disasters by economic status, for example, would highlight the relationship between natural disasters and poverty.
- Occurrence of seasonal food shortages. For example, the percentage of communities with farmer support organizations, classified by occurrence of seasonal food shortages, would indicate whether support was available for needy farmers.

Community-level data as classification items for core and supplementary modules

12.34. The selection of community-level classification items for the tabulation of holding-level data in the core and supplementary modules will depend on the content of the community survey. Typical community-level classification items are:

- Access to urban centre. This item is useful for analyzing agricultural practices of people living in isolated localities. Access can be defined in terms of the travelling time from the community to the nearest urban centre, or according to whether or not the community is connected to the urban centre by a year-round motorable road.
- Risk of natural disasters. This item can be used to analyse how farmers adapt their agricultural practices to cope with natural disasters, and the food security consequences. Sometimes, the classification shows the type of natural disaster, such as flood or storm.
- Economic status. If this item is available from the community survey, it could be used to classify communities as “rich” or “poor”, to provide a poverty dimension to the analysis of the core and supplementary census data. Sometimes, “poor” is divided further into “hungry” and “not hungry” groups.
- Occurrence of seasonal food shortages. This is a useful classification item for analyzing the food security aspects of agricultural holdings.
- Presence of periodic agricultural produce market. This item can be defined according to whether or not the community has a periodic agricultural produce market, or in terms of the travelling time from the community to the nearest agricultural produce market. This item is useful for analyzing crop and livestock activities in relation to the availability of markets.
- Access to veterinary services. This item can be defined according to whether or not veterinary services are available in the community, or on the basis of the travelling time from the community to the nearest veterinary services. This can be a useful classification item for analyzing livestock data, such as livestock deaths.
- Access to farm input trading centre. This is defined according to whether or not an input trading centre is available in the community, or on the basis of the travelling time from the community to the nearest input supplier. Sometimes, access for each type of input is provided. This classification item can be used to examine the constraints to improving agricultural productivity as a result of difficulties in accessing farm inputs.
- Access to rural bank. This is defined according to whether or not there is a rural bank in the community, or in terms of the travelling time from the community to the nearest rural bank. This classification item can be especially useful in analyzing credit data in relation to how easy it is to access a rural bank.

Figure 12.5: Agricultural census core module: cross-tabulations with community data

Core item	Community-level classification item									
	Access to urban centre	Risk of natural disasters	Economic status	Occurrence of seasonal food shortages	Presence of periodic produce market	Access to veterinary services	Access to farm input trading centre	Access to rural bank	Access to farmers' association	Development programme
0001 Location of agricultural holding										
0002 Legal status										
0003 Sex of holder			✓	✓						
0004 Age of holder			✓	✓						
0005 Household size			✓	✓				✓	✓	
0006 Main purpose of production	✓		✓	✓					✓	
0007 Land use type		✓								
0008 Area of holding		✓	✓	✓				✓	✓	
0009 Land tenure type			✓	✓						
0010 Irrigation		✓	✓	✓	✓		✓	✓		
0011 Temporary crops	✓	✓			✓		✓	✓		✓
0012 Permanent crops	✓	✓			✓		✓	✓	✓	✓
0013 Livestock numbers	✓	✓			✓	✓		✓		
0014 Aquaculture					✓					
0015 Forest and other wooded land										
0016 Other economic activities	✓	✓	✓							✓

- Access to farmers' association. This is usually defined according to whether or not farmers' associations exist in the community. Sometimes, the different types of associations are identified. This item can help to study the benefits to farmers of such associations.
- Presence of government development programmes. This can be a useful classification item to examine how such programmes have benefited farmers.

12.35. For the core census module, the most common cross-tabulations with the community-level classification items are shown in Figure 12.5. The rows show the core items, and the columns show the ten main community-level classification items given in paragraph 12.34. The use of Figure 12.5 is illustrated in the following example. Item "area of holding" (row) is shown against community-level classification item "economic status" (column); this means that a table should be prepared showing this cross-tabulation.

12.36. For the census supplementary modules, it is not possible to provide an exhaustive list of cross-tabulations. Instead, a summary of the main classification items relevant to each of the 12 census supplementary themes is shown in Figure 12.6. The rows show the supplementary module themes, and the columns show the ten main community-level classification items given in paragraph 12.34.

12.37. The following example illustrates the use of Figure 12.6. Four main community-level classification items (access to urban centre, risk of natural disasters, economic status, and occurrence of seasonal food shortages) are shown as being relevant to the theme "household food security". This means that any item under the heading "household food security" – such as heights and weights of

children – should be suitable for tabulating against these community-level classification items.

Figure 12.6: Agricultural census supplementary modules: cross-tabulations with community data

Theme	Community-level classification item									
	Access to urban centre	Risk of natural disasters	Economic status	Occurrence of seasonal food shortages	Presence of periodic produce market	Access to veterinary services	Access to farm input trading centre	Access to rural bank	Access to farmers' association	Development programme
0001 Land			✓							
0002 Irrigation and water management			✓							
0003 Crops	✓	✓	✓	✓	✓		✓			
0004 Livestock	✓		✓			✓				
0005 Agricultural practices	✓	✓	✓	✓			✓	✓	✓	✓
0006 Agricultural services	✓	✓						✓	✓	
0007 Demographic and social characteristics								✓		
0008 Economic activity of household members	✓		✓	✓	✓					
0009 Household food security	✓	✓	✓	✓						
0010 Aquaculture										
0011 Forestry										
0012 Management of the holding			✓							

Part C: Census of agriculture and aquaculture

Core module: cross-tabulations

12.38. For the core module of the census of agriculture and aquaculture, tables are required for both components of the census.

12.39. For the agricultural census component, the tabulation programme is the same as in an agriculture-only census (see paragraphs 12.19–12.24).

12.40. For the aquacultural census component, the tabulation programme is different. Some of the classification items used in the agricultural census are not as important for the aquacultural census component. In particular, crop and livestock data are usually not applicable to aquacultural holdings. Seven main classification items are recommended for the aquacultural census, made up of six items used for agricultural census tabulations and one item specific to aquaculture. These are shown below, together with the relevant reference group.

- Administrative or agro-ecological zone (*Reference group: all aquacultural holdings*): as for agricultural holding tables (see paragraph 12.9).
- Legal status of holder (*Reference group: all aquacultural holdings*): as for agricultural holding tables (see paragraph 12.10).
- Area of holding (*Reference group: all aquacultural holdings*): as for agricultural holding tables (see paragraph 12.11).

Figure 12.7: Aquacultural census core module: recommended cross-tabulations

Core item	Main classification item						
	Admin./ecological zone	Legal status of holder	Area of holding	Area of aquaculture	Household size	Sex of holder	Age of holder
0001 Location	::						
0002 Legal status	✓	..	✓	✓			
0003 Sex of holder	✓				
0004 Age of holder	✓						..
0005 Household size				..			
0006 Main purpose of production	✓		✓	✓	✓		
0007 Land use type	✓	✓	✓	✓			
0008 Area of holding	✓		..		✓	✓	✓
0009 Land tenure type	✓		✓	✓			
0010 Irrigation	✓						
0011 Temporary crops	✓						
0012 Permanent crops	✓						
0013 Livestock numbers	✓						
0014 Aquaculture							
0015 Forest and other wooded land	✓						
0016 Other economic activities	✓		✓	✓	✓		
0017 Area of aquaculture	✓		✓	✓	✓	✓	✓

- Area of aquaculture (*Reference group: all aquacultural holdings*). This is based on Item 0017 (see paragraph 7.20). The area groupings should be the same as for area of holding (see Figure 12.1). This is a useful as a measure of size of the aquacultural activities.
- Household size (*Reference group: all aquacultural holdings in sector "single-holding household" in Item 0002*): as for agricultural holding tables (see paragraph 12.15).
- Sex of holder (*Reference group: all aquacultural holdings in sector "single-holding household" in Item 0002*): as for agricultural holding tables (see paragraph 12.16).
- Age of holder (*Reference group: all aquacultural holdings in sector "single-holding household" in Item 0002*): as for agricultural holding tables (see paragraph 12.17).

12.41. Common cross-tabulations for the aquacultural census core module are shown in Figure 12.7.

Supplementary modules: cross tabulations

12.42. The tabulation programme for the supplementary modules depends on the type of module and the units covered. If the module covers agricultural production units only, the tabulation programme is the same as in an agricultural census (see paragraphs 12.25–12.29). For an aquacultural module, the eight main classification items (see paragraph 12.40) would provide the basis of the tabulation programme.

APPENDIXES

THE AGRICULTURAL CENSUS WITHIN THE FRAMEWORK OF THE SYSTEM OF NATIONAL ACCOUNTS

The SNA/ISIC framework

The System of National Accounts (SNA) provides a standard national accounting framework for reporting of national income and product statistics. International standards for concepts, definitions and classifications are presented by the United Nations (UN et al, 1993). A supplement to the SNA covering the food and agricultural sector has been issued by FAO (FAO, 1996b).

The SNA defines two main types of economic production units: enterprises and establishments.

- An enterprise is an economic unit of production, under single management, that independently directs and manages all the functions needed to carry out production activities. An enterprise may engage in more than one type of activity and may have its operations in more than one location. Enterprises may be corporations, government institutions or other units, including households.
- An establishment is an enterprise or part of an enterprise situated in a single location and primarily engaged in a single type of production activity. Any secondary activity should be on a small scale. An enterprise that is engaged in growing crops as well as processing the crops on a significant scale is considered as two establishments, corresponding to the two types of activities.

To help describe different types of activities in the economy, establishments are assigned to industries. International guidelines for defining industries are presented in the International Standard Industrial Classification of Economic Activities (ISIC), issued by the United Nations. The current version of ISIC is Revision 3.1 (UN, 2004b).

ISIC provides a hierarchical classification of activities. Thus, in ISIC (Rev. 3.1), the first level (Agriculture, Hunting and Forestry) is divided into two divisions: (i) Agriculture, Hunting and Related Service Activities; and (ii) Forestry, Logging and Related Service Activities. These divisions are then further sub-divided into groups and classes corresponding to more specific activities, such growing of crops and farming of animals.

Scope of the agricultural census

The agricultural census aims to cover establishments engaged in agricultural production activities. Normally, this is restricted to units engaged in the production of agricultural goods; namely, crops and livestock products. This corresponds to the following ISIC (Rev. 3.1) groups:

- Group 011: Growing of crops; market gardening; horticulture.
- Group 012: Farming of animals.
- Group 013: Growing of crops combined with farming of animals (mixed farming).

Under SNA principles, another type of unit is also engaged in agricultural production activities; namely, units producing agricultural services. These are defined under ISIC (Rev. 3.1) as:

- Group 014: Agricultural and animal husbandry service activities, except veterinary activities.

This group includes support activities for crop and livestock production, such as crop spraying, pruning, sheep shearing and agistment services. These service activities are becoming increasingly important, but are generally not included within the scope of the agricultural census.

The agricultural holding as an establishment

Under SNA, an establishment in the agricultural industry (ISIC Groups 011, 012 and 013) is one whose principal activity is in one of the designated ISIC groups. Such an establishment may also have a secondary activity not related to agriculture. Similarly, an establishment in a non-agricultural industry may have a secondary activity in agriculture. Thus, establishments in the three ISIC groups do not provide full coverage of all agricultural production activities.

An agricultural holding is an economic unit of agricultural production under single management. If the principal economic production activity of the agricultural holding is agricultural production, the agricultural holding is an establishment in the agricultural industry. However, the two units are not the same if the agricultural production activity of the agricultural holding is a secondary activity of a non-agricultural establishment. Here, the agricultural holding may be considered as an establishment-like unit in the agricultural industry. For the purposes of the agricultural census, the agricultural holding is treated as being equivalent to an establishment unit under the SNA framework.

Most agricultural production activities are undertaken by households. For the household sector, the enterprise is the agricultural production management unit in the household, and the agricultural holding (establishment) is the unit of agricultural production within the management unit. Thus, usually:

- There is only one management unit in the household and therefore the household itself is the enterprise.
- There is only one agricultural production establishment in the household and therefore, the agricultural holding is equivalent to the agricultural production activities of the household.

However, there are some special cases.

- If two family units in a household manage agricultural production activities independently, each family unit corresponds to an enterprise (because they are separate agricultural management units). Each family unit (enterprise) contains one agricultural holding (establishment) unit. This is consistent with the treatment of multiple agricultural production activities in the agricultural census.
- If a household undertakes agricultural production activities both on its own and in partnership with other households, there are two separate management units associated with the household, which therefore corresponds to two enterprises. Each enterprise unit contains one agricultural holding (establishment) unit. This is consistent with the treatment of partnerships in the agricultural census.

In SNA terms, an agricultural holding in the household sector, as an establishment unit, consists of the agricultural production activities of the household enterprise unit, plus any small-scale secondary activities. Any significant economic activities in the household enterprise unit outside the three ISIC groups covered by agricultural censuses are considered to be activities of other establishments. Thus, a household that engages in significant forestry activity as well as its primary agricultural activity consists of two establishment units: an agricultural establishment and a forestry establishment. Thus, data on forestry or fisheries collected in agricultural censuses do not, technically speaking, relate to the agricultural holding as such, but to the enterprise unit of which the holding is a part. This helps to clarify the interpretation of non-agricultural data collected in the agricultural census; in other words, the agricultural census is collecting two types of data: (i) agriculture-related data about the holding (establishment); and (ii) other data about the household (enterprise) unit.

One problem in linking the agricultural holding unit with the establishment unit is the single location concept in the definition of establishment. The land operated by an agricultural holding under single management often consists of more than one parcel. By definition, each parcel is usually in a different location (a parcel is a piece of land, of one tenure type, entirely surrounded by land not operated by the holding). Thus, in principle, each parcel of land could be seen as corresponding to an establishment. In SNA, there is some flexibility in the interpretation of single location; for agricultural holdings, it may be interpreted more broadly as covering activities within a specific administrative unit such as a district or province. The agricultural

holding definition refers to parcels sharing the same inputs such as labour; this limits the extent of geographical dispersion of land in a single holding and is consistent with the SNA establishment concept.

Aquaculture

Aquacultural data collected in the agricultural census relate to aquacultural activities carried out in association with the agricultural production activities of the agricultural holding, using the same inputs. In SNA terms, the agricultural and aquacultural activities are in different ISIC divisions, and conceptually, the two activities should be considered as different establishment units, even though they are closely related. However, if the aquacultural activity is small-scale compared with the holding's principal agricultural production activity, it may be considered as a secondary activity of the agricultural holding as part of the agricultural industry.

An aquacultural census covers aquacultural production activities, defined by ISIC (Rev. 3.1) as:

- Class 0502: Aquaculture.

The statistical unit for an aquacultural census is the aquacultural holding, defined as an economic unit of aquacultural production under single management. In SNA terms, an aquacultural holding is an establishment in the aquacultural industry; that is, in ISIC (Rev. 3.1) Class 0502. This is analogous to the concept of an agricultural holding in the agricultural industry.

Conceptually, the agricultural census and the aquacultural census are separate censuses of different industries. However, they can often be combined into a single field enumeration system as part of a census of agriculture and aquaculture.

Other economic production activities (Item 0016)

Item 0016 in the list of recommended core items refers to activities, other than agricultural production on the holding, carried out by the enterprise of which the holding is a part. According to SNA principles, each type of economic activity in a given location is carried out by a separate establishment. Thus, if the household is also engaged in collecting forest products and operating a shop, then both these activities represent establishments. A household could also be engaged in agricultural production activities outside the holding; for example, if there are two holdings in a household or if the household is involved in a partnership agreement.

All activities are classified according to ISIC (Rev. 3.1) as follows:

- Other agricultural production activities: ISIC Groups 011–013.
- Agricultural services: ISIC Group 014.
- Hunting, trapping, game propagation and related service activities: ISIC Group 015. This group, together with Agricultural services (ISIC Group 014) covers the rest of ISIC Division 01, not included within the scope of the agricultural census.
- Forestry, logging and related service activities: ISIC Division 02.
- Fishing, aquaculture and related service activities: ISIC Division 05.
- Manufacturing: ISIC Divisions 15–37.
- Wholesale and retail trade: ISIC Divisions 50–52.
- Hotels and restaurants: ISIC Division 55.
- Other: all other ISIC classes not covered in the above.

INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL ECONOMIC ACTIVITIES (ISIC¹): SCOPE OF THE AGRICULTURAL CENSUS

ISIC Group 011: Growing of crops; market gardening; horticulture

This group comprises the activity of growing temporary and permanent crops in the open or under cover. It consists of three ISIC classes:

- ISIC Class 0111: Growing of cereals and other crops n.e.c.
- ISIC Class 0112: Growing of vegetables, horticultural specialties and nursery products.
- ISIC Class 0113: Growing of fruit, nuts, beverage and spice crops.

The following are included:

- growing of all types of crops including cereal grains, roots and tubers, legumes, industrial crops, vegetables, horticulture, fodder crops, seed crops, and fruit and nut trees;
- growing or production of horticultural specialties including seeds for flowers, unrooted cuttings or slips, bulbs, tubers, tuberous roots, corms, crowns or rhizomes;
- drying of tobacco leaves associated with the growing of tobacco;
- growing of rubber trees and harvesting of latex;
- growing of plants used chiefly in pharmacy or for insecticidal, fungicidal or similar purposes;
- growing of flowers or flower buds;
- growing of living plants for planting or ornamental purposes, including turf for transplanting;
- production of wine from self-produced grapes;
- gathering of berries or nuts;
- growing of mushrooms or gathering of forest mushrooms or truffles;
- gathering of sap and production of maple syrup and sugar.

The following are excluded:

- gathering of forest products and other wild growing materials such as cork, resins and balsam;
- operation of forest tree nurseries or growing of Christmas trees;
- production of olive oil or wine (except from self-produced grapes);
- processing of tea, coffee and cocoa.

ISIC Group 012: Farming of animals

This group comprises the activity of farming of animals. It consists of two ISIC classes:

- ISIC Class 0121: Farming of cattle, sheep, goats, horses, asses, mules and hinnies, dairy farming.
- ISIC Class 0122: Other animal farming, production of animal products n.e.c.

The following are included:

- Raising of all types of livestock and poultry;
- stud farming;
- production of raw milk and bovine semen;
- production of live animal products such as eggs, honey and silkworm cocoons;
- operation of poultry hatcheries;
- raising in captivity of semi-domesticated or wild live animals including birds, reptiles, insects, rabbits and other fur animals;
- production of fur skins, reptile or bird skins from a ranching operation;

¹ ISIC, Revision 3.1

- operation of dog and cat farms, worm farms, land mollusc farms, frog farms, etc.;
- raising of silk worms, production of silk worm cocoons;
- bee-keeping and production of honey and beeswax.

The following are excluded:

- farm animal boarding, care and breeding;
- production of pulled wool;
- processing of milk outside the farm;
- operation of racing stables and riding academies;
- production of hides and skins originating from hunting and trapping;
- production of hides and skins from slaughterhouses;
- production of feathers or down;
- training of animals;
- operation of fish farms and fish hatcheries (included in ISIC Class 0502).

ISIC Group 013: Growing of crops combined with farming of animals (mixed farming)

This group covers the activity of crop growing in combination with farming of livestock at mixed activity units.

ISIC Class 0502: Aquaculture (if aquacultural census also conducted)

This class comprises the activity of fish farming or aquaculture from marine or freshwater environments. It includes:

- fish farming in seawater or freshwater including farming of ornamental fish;
- production of oyster spat, mussel, lobsterlings, shrimp post-larvae, fish fry and fingerlings;
- cultivation of oysters;
- operation of fish hatcheries;
- service activities incidental to the operation of fish hatcheries and fish farms.

The following are excluded:

- frog farming (included in ISIC Group 012);
- operation of sport fishing reserves.

CLASSIFICATION OF CROPS

A new crop classification, the Indicative Crop Classification (ICC) has been developed for the 2010 round of agricultural censuses, and is given at the end of this appendix.

The crop classification used in the 2000 agricultural census programme reflected various elements related to crops, including the growing cycle (temporary/permanent), crop species, crop variety (for example, hybrid/ordinary maize), season (for example, winter/spring wheat), land type (for example, wetland/dryland rice), crop use (for example, pumpkin for food/fodder), type of product (for example, fresh/dried beans), how the crop is processed (for example, industrial crops), and cultivation methods (for example, crops grown under protective cover).

ICC has been developed based on the Central Product Classification (CPC) (UN, 2004a). CPC classifies goods and services into categories based on the nature of the product and industry of origin. Crop products are classified mainly according to the type of crop. CPC itself is based on the Harmonized Commodity Description and Coding System (HS), a classification of the World Customs Organization. CPC is also broadly compatible with ISIC, in that the industry of origin is related to ISIC. ICC is also consistent with the classification of commodities used in FAO's on-line database, FAOSTAT.

From a statistical point of view, the crop classification should be closely related to the product classification, and to some extent to the economic activity classification (ISIC). The crop classification refers to which crops are grown, whereas the product classification refers to the product(s) generated from that crop. Thus, "mustard" is an oilseed crop, whereas "mustard seed" is the oilseed product. There is not always a one-to-one correspondence between a crop and a product. The same crop may yield two products – for example, cotton may yield cotton fibre and cotton seed.

The current version of CPC, Version 1.0, is currently being revised. ICC is based on the draft of the revised CPC, to which FAO has provided input. ICC classifies crops into categories based on three main elements:

- Product type. The product type is provided in the structure of CPC, especially at the group and class level. Thus, under ICC, crops are first divided into groups such as cereals, vegetables, etc., and each group is further sub-divided by crop type, such as leafy/stem vegetables, fruit-bearing vegetables, etc.
- Crop genus or species. At the lowest level of the classification, each crop can be described by its botanical name; thus, "Lentils" (Class 75) is identified as the species "Lens culinaris". However, it should be noted that ICC is not a botanical classification, as the groupings are based more on the agricultural use of the crop than the botanical similarities between crops. Thus, "Oilseed crops" (Group 4) is a grouping of crops of many different botanical types that produce the same type of product: oil.
- Whether the crop is temporary or permanent. CPC does not always permit a temporary/permanent split, because this is not important in a product classification. However, this distinction is fundamental to a crop classification. Because of this, some CPC classes are divided into temporary and permanent sub-classes. In ICC, a separate code is provided to indicate whether the crop is temporary or permanent.

A major change in ICC from the previous crop classification is that, as a general principle, a particular crop is classified only once in the classification, regardless of how the crop is used. Thus, pumpkin is assigned to Sub-class 226 under Group 2 (vegetables). Previously, pumpkins were shown in different parts of the classification as "Pumpkin for food" or "Pumpkin for fodder". Also, pepper is assigned to Order 6211, regardless of whether it is used for fresh or dried produce.

If a country wishes to separately identify the different uses of a crop – such as food or fodder, fresh or dried, fruit or oil, and industrial or non-industrial – it has two options:

- Further sub-divide the crop in the crop classification, as required. Thus, Sub-class 226 could be subdivided into: 2261 (Pumpkin for food) and 2262 (Pumpkin for fodder). If data on fodder crops are required from the agricultural census, the relevant fodder crop codes can be grouped.
- Include an item in the agricultural census on end-use of the crop.

The following examples illustrate how to handle multiple-use crops in developing a crop classification based on ICC:

- All grain and vegetable crops should be assigned to Groups 1 or 2, regardless of whether they are used for human consumption or as animal feed. Note that Class 91 (Grasses and other fodder crops) refers to crops that are solely fodder crops.
- The same principle applies to sugar crops. Maize should be designated as a cereal crop (Class 12), even if it is used as a sugar crop. Note that Group 8 (Sugar crops) refers to sugar beet, sugar cane and other specific sugar crops.
- Crops such as coconut that are grown either as a fruit crop or as an oil crop should be classified according to its primary use in the country. In ICC, it has been shown as an oil crop (Sub-class 441).
- Problems arise where the same physical crop is used for harvesting two products. The use of cotton to produce cottonseed and cotton fibre is one example. Such a crop should be shown only once in the harvested area data (harvested area relates to the area of the principal crop harvested – see paragraph 11.105), but could have a secondary use in production data. The crop should be classified according to its primary use in the country. In ICC, cotton has been defined as a fibre crop (Order 9211), as an illustration.

ICC provides only a broad-level structure for the classification of crops. For Groups 1–8, ICC is consistent with CPC at the group level, and generally consistent at the class level. At the sub-class level, the two classifications are similar.

To help countries use ICC, an alphabetical list of crops with botanical names and crop codes is shown in Appendix 4. More information on the definitions of crops is contained in *Definition and Classification of Commodities* (FAO, 1996c).

Note that the different levels of ICC – namely, groups, classes, sub-classes and orders – do not relate in any way to the same terms used in the botanical taxonomic hierarchy.

As in the past, the crop classification needs to be adapted by countries to take account of national conditions. Not all crops are applicable to all countries. Countries will also wish to separately identify crops not shown in ICC or to show crops in more detail than given in ICC. In particular, countries may wish to provide more detail for important national crops; for example, a rice-producing country may wish to show rice classified by variety, season or land type.

Indicative Crop Classification Version 1.0 (ICC)

Group	Class	Sub-class	Order	Title	Crop type ¹	
1				Cereals	1	
	11			Wheat	1	
	12			Maize	1	
	13			Rice	1	
	14			Sorghum	1	
	15			Barley	1	
	16			Rye	1	
	17			Oats	1	
	18			Millet	1	
	19			Other cereals, n.e.c.	1	
			191	<i>Mixed cereals</i>	1	
		192	<i>Other</i>	1		
2	21			Vegetables and melons	1	
				Leafy or stem vegetables	1	
		211		<i>Artichokes</i>	1	
		212		<i>Asparagus</i>	1	
		213		<i>Cabbages</i>	1	
		214		<i>Cauliflowers & broccoli</i>	1	
		215		<i>Lettuce</i>	1	
		216		<i>Spinach</i>	1	
		217		<i>Chicory</i>	1	
	219		<i>Other leafy or stem vegetables, n.e.c.</i>	1		
	22				Fruit-bearing vegetables	1
		221		<i>Cucumbers</i>	1	
		222		<i>Eggplants (aubergines)</i>	1	
		223		<i>Tomatoes</i>	1	
		224		<i>Watermelons</i>	1	
		225		<i>Cantaloupes and other melons</i>	1	
		226		<i>Pumpkin, squash and gourds</i>	1	
		229		<i>Other fruit-bearing vegetables, n.e.c.</i>	1	
	23				Root, bulb, or tuberous vegetables	1
		231		<i>Carrots</i>	1	
		232		<i>Turnips</i>	1	
		233		<i>Garlic</i>	1	
		234		<i>Onions (incl. shallots)</i>	1	
		235		<i>Leeks & other alliaceous vegetables</i>	1	
239		<i>Other root, bulb, or tuberous vegetables, n.e.c.</i>	1			
24			Mushrooms and truffles	1		
29			Vegetables, n.e.c.	1		
3	31			Fruit and nuts	2	
				Tropical and subtropical fruits	2	
		311		<i>Avocados</i>	2	
		312		<i>Bananas & plantains</i>	2	
		313		<i>Dates</i>	2	
		314		<i>Figs</i>	2	
		315		<i>Mangoes</i>	2	
		316		<i>Papayas</i>	2	
		317		<i>Pineapples</i>	2	
	319		<i>Other tropical and subtropical fruits, n.e.c.</i>	2		
	32				Citrus fruits	2
		321		<i>Grapefruit & pomelo</i>	2	
		322		<i>Lemons and Limes</i>	2	
		323		<i>Oranges</i>	2	
		324		<i>Tangerines, mandarins, clementines</i>	2	
329			<i>Other citrus fruit, n.e.c.</i>	2		

1. 1 = temporary; 2 = permanent.

Group	Class	Sub-class	Order	Title	Crop type ¹
	33			Grapes	2
	34			Berries	2
		341		<i>Currants</i>	2
		342		<i>Gooseberries</i>	2
		343		<i>Kiwi fruit</i>	2
		344		<i>Raspberries</i>	2
		345		<i>Strawberries</i>	2
		346		<i>Blueberries</i>	2
		349		<i>Other berries</i>	2
	35			Pome fruits and stone fruits	2
		351		<i>Apples</i>	2
		352		<i>Apricots</i>	2
		353		<i>Cherries & sour cherries</i>	2
		354		<i>Peaches & nectarines</i>	2
		355		<i>Pears & quinces</i>	2
		356		<i>Plums and sloes</i>	2
		359		<i>Other pome fruits and stone fruits, n.e.c.</i>	2
	36			Nuts	2
		361		<i>Almonds</i>	2
		362		<i>Cashew nuts</i>	2
		363		<i>Chestnuts</i>	2
		364		<i>Hazelnuts</i>	2
		365		<i>Pistachios</i>	2
		366		<i>Walnuts</i>	2
		369		<i>Other nuts n.e.c.</i>	2
	39			Other fruits, n.e.c.	2
4				Oilseed crops	
	41			Soya beans	1
	42			Groundnuts	1
	43			Other temporary oilseed crops	1
		431		<i>Castor bean</i>	1
		432		<i>Linseed</i>	1
		433		<i>Mustard</i>	1
		434		<i>Niger seed</i>	1
		435		<i>Rapeseed</i>	1
		436		<i>Safflower</i>	1
		437		<i>Sesame</i>	1
		438		<i>Sunflower</i>	1
		439		<i>Other temporary oilseed crops, n.e.c.</i>	1
	44			Permanent oilseed crops	2
		441		<i>Coconuts</i>	2
		442		<i>Olives</i>	2
		443		<i>Oil palms</i>	2
		449		<i>Other oleaginous fruits, n.e.c.</i>	2
5				Root/tuber crops with high starch or inulin content	1
	51			Potatoes	1
	52			Sweet potatoes	1
	53			Cassava	1
	54			Yams	1
	59			Other roots & tubers, n.e.c.	1
6				Beverage and spice crops	
	61			Beverage crops	2
		611		<i>Coffee</i>	2
		612		<i>Tea</i>	2
		613		<i>Maté</i>	2
		614		<i>Cocoa</i>	2
		619		<i>Other beverage crops, n.e.c.</i>	2

1. 1 = temporary; 2 = permanent.

Group	Class	Sub-class	Order	Title	Crop type ¹
	62	621		Spice crops <i>Temporary spice crops</i>	1
			6211	Chilies & peppers (capsicum spp.)	1
			6212	Anise, badian, and fennel	1
			6219	Other temporary spice crops, n.e.c.	1
		622		<i>Permanent spice crops</i>	2
			6221	Pepper (piper spp.)	2
			6222	Nutmeg, mace, cardamoms	2
			6223	Cinnamon (canella)	2
			6224	Cloves	2
			6225	Ginger	2
			6226	Vanilla	2
			6229	Other permanent spice crops, n.e.c.	2
7				Leguminous crops	1
	71			Beans	1
	72			Broad beans	1
	73			Chick peas	1
	74			Cow peas	1
	75			Lentils	1
	76			Lupins	1
	77			Peas	1
	78			Pigeon peas	1
	79			Leguminous crops, n.e.c.	1
8				Sugar crops	1
	81			Sugar beet	1
	82			Sugar cane	1
	83			Sweet sorghum	1
	89			Other sugar crops n.e.c.	1
9				Other crops	
	91			Grasses and other fodder crops	
		911		<i>Temporary grass crops</i>	1
		912		<i>Permanent grass crops</i>	2
	92			Fibre crops	
		921		<i>Temporary fibre crops</i>	1
			9211	Cotton	1
			9212	Jute, kenaf, and other similar crops	1
			9213	Flax, hemp, and other similar products	1
			9219	Other temporary fibre crops	1
		922		<i>Permanent fibre crops</i>	2
	93			Medicinal, aromatic, pesticidal, or similar crops	
		931		<i>Temporary medicinal, etc. crops</i>	1
		932		<i>Permanent medicinal, etc. crops</i>	2
	94			Rubber	2
	95			Flower crops	
		951		<i>Temporary flower crops</i>	1
		952		<i>Permanent flower crops</i>	2
	96			Tobacco	1
	99			Other crops	
		991		<i>Other crops – temporary</i>	1
		992		<i>Other crops – permanent</i>	2

1. 1 = temporary; 2 = permanent.

APPENDIX 4

ALPHABETICAL LIST OF CROPS WITH BOTANICAL NAME AND CROP CODE

Crop name	Botanical name	ICC code	Previous code ¹
Abaca (Manila hemp)	<i>Musa textilis</i>	9213	2.2.4.1
Alfalfa for fodder	<i>Medicago sativa</i>	911	1.7.1.1
Alfalfa for seed	<i>Medicago sativa</i>	911	1.8.2
Almond	<i>Prunus dulcis</i>	361	2.1.7.1
Anise seeds	<i>Pimpinella anisum</i>	6212	1.4.3.4
Apple	<i>Malus sylvestris</i>	351	2.1.2.1
Apricot	<i>Prunus armeniaca</i>	352	2.1.3.1
Areca (betel nut)	<i>Areca catechu</i>	992	2.2.7.6
Arracha	<i>Arracacia xanthorrhiza</i>	59	1.2.9
Arrowroot	<i>Maranta arundinacea</i>	59	1.2.5
Artichoke	<i>Cynara scolymus</i>	211	1.5.1.0.1
Asparagus	<i>Asparagus officinalis</i>	212	1.5.1.0.2
Avocado	<i>Persea americana</i>	311	2.1.6.0.1
Bajra (Pearl millet)	<i>Pennisetum americanum</i>	18	1.1.5.1.2
Bambara groundnut	<i>Vigna subterranea</i>	79	1.3.9
Banana	<i>Musa paradisiaca</i>	312	2.1.6.0.2
Barley	<i>Hordeum vulgare</i>	15	1.1.4
Beans, dry, edible, for grains	<i>Phaseolus vulgaris</i>	71	1.3.1
Beans, harvested green	<i>Phaseolus and Vigna spp.</i>	71	1.5.4.1
Beet, fodder (mangel)	<i>Beta vulgaris</i>	81	1.7.5.0.5
Beet, red	<i>Beta vulgaris</i>	81	1.5.3.5
Beet, sugar	<i>Beta vulgaris</i>	81	1.4.1.2
Beet, sugar for fodder	<i>Beta vulgaris</i>	81	1.7.5.0.6
Beet, sugar for seeds	<i>Beta vulgaris</i>	81	1.8.1
Bergamot	<i>Citrus bergamia</i>	329	2.1.1.6
Betel nut	<i>Areca catechu</i>	992	2.2.7.6
Black pepper	<i>Piper nigrum</i>	6221	2.2.3.1
Black wattle	<i>Acacia mearnsii</i>	992	2.2.5.2
Blackberries of various species	<i>Rubus spp.</i>	349	2.1.5.7
Blueberry	<i>Vaccinium spp.</i>	346	2.1.5.1
Brazil nut	<i>Bertholletia excelsa</i>	369	2.1.7.6
Breadfruit	<i>Artocarpus altilis</i>	319	2.1.6.0.3
Broad bean, dry	<i>Vicia faba</i>	72	1.3.2
Broad bean, harvested green	<i>Vicia faba</i>	72	1.5.4.3
Broccoli	<i>Brassica oleracea var. botrytis</i>	214	1.5.5.1
Broom millet	<i>Sorghum bicolor</i>	18	1.4.5.4
Broom sorghum	<i>Sorghum bicolor</i>	14	1.4.5.4
Brussels sprouts	<i>Brassica oleracea var. gemmifera</i>	219	1.5.1.0.3
Buckwheat	<i>Fagopyrum esculentum</i>	192	1.1.9
Cabbage (red, white, Savoy)	<i>Brassica oleracea var. capitata</i>	213	1.5.1.0.4
Cabbage, Chinese	<i>Brassica chinensis</i>	213	1.5.1.0.7
Cabbage, for fodder	<i>Brassica spp.</i>	213	1.7.5.0.1
Cacao (cocoa)	<i>Theobroma cacao</i>	614	2.2.1.2
Cantaloupe	<i>Cucumis melo</i>	225	1.5.2.0.1
Caraway seeds	<i>Carum carvi</i>	6219	1.4.3.4
Cardamom	<i>Elettaria cardamomum</i>	6222	2.2.3.7
Cardoon	<i>Cynara cardunculus</i>	219	1.5.1.1.5
Carob	<i>Ceratonia siliqua</i>	39	2.1.6.1.5
Carrot, edible	<i>Daucus carota ssp. sativa</i>	231	1.5.3.1
Carrot, for fodder	<i>Daucus carota ssp. sativa</i>	231	1.7.5.1.0
Cashew nuts	<i>Anacardium occidentale</i>	362	2.1.7.2
Cassava (manioc)	<i>Manihot esculenta</i>	53	1.2.3

1. Crop codes used in 2000 agricultural census programme.

Crop name	Botanical name	ICC code	Previous code¹
Castor bean	<i>Ricinus communis</i>	431	1.4.2.1.0
Cauliflower	<i>Brassica oleracea</i> var. <i>botrytis</i>	214	1.5.5.1
Celeriac	<i>Apium graveolens</i> var. <i>rapaceum</i>	239	1.5.3.8
Celery	<i>Apium graveolens</i>	219	1.5.1.0.5
Chayote	<i>Sechium edule</i>	229	1.5.2.1.2
Cherry (all varieties)	<i>Prunus</i> spp.	353	2.1.3.2
Chestnut	<i>Castanea sativa</i>	363	2.1.7.4
Chickpea (gram pea)	<i>Cicer arietinum</i>	73	1.3.4
Chicory	<i>Cichorium intybus</i>	217	1.4.5.2
Chicory for greens	<i>Cichorium intybus</i>	217	1.5.1.0.6
Chili, dry (all varieties)	<i>Capsicum</i> spp. (<i>annuum</i>)	6211	1.4.3.1
Chili, fresh (all varieties)	<i>Capsicum</i> spp. (<i>annuum</i>)	6211	1.5.2.0.2
Cinnamon	<i>Cinnamomum verum</i>	6223	2.2.3.2
Citron	<i>Citrus medica</i>	329	2.1.1.6
Citronella	<i>Cymbopogon citrates/ Cymbopogon nardus</i>	992	2.2.7.1
Clementine	<i>Citrus reticulata</i>	324	2.1.1.2
Clove	<i>Eugenia aromatica (Syzygium aromaticum)</i>	6224	2.2.3.3
Clover for fodder (all varieties)	<i>Trifolium</i> spp.	911	1.7.1.2
Clover for seed (all varieties)	<i>Trifolium</i> spp.	911	1.8.3
Cocoa (cacao)	<i>Theobroma cacao</i>	614	2.2.1.2
Coconut	<i>Cocos nucifera</i>	441	2.2.2.1
Cocoyam	<i>Colocasia esculenta</i>	59	1.2.8
Coffee	<i>Coffea</i> spp.	611	2.2.1.1
Cola nut (all varieties)	<i>Cola acuminata</i>	619	2.2.1.6
Colza (rapeseed)	<i>Brassica napus</i>	435	1.4.2.0.5
Corn (maize), for cereals	<i>Zea mays</i>	12	1.1.3
Corn (maize), for silage	<i>Zea mays</i>	12	1.7.3.1
Corn (sweet), for vegetable	<i>Zea mays</i>	12	1.5.5.2
Corn for salad	<i>Valerianella locusta</i>	219	1.5.1.1.5
Cotton (all varieties)	<i>Gossypium</i> spp.	9211	1.4.4.1
Cottonseed (all varieties)	<i>Gossypium</i> spp.	9211	1.4.2.0.8
Cowpea, for grain	<i>Vigna unguiculata</i>	74	1.3.6
Cowpea, harvested green	<i>Vigna unguiculata</i>	74	1.5.4.3
Cranberry	<i>Vaccinium</i> spp.	349	2.1.5.2
Cress	<i>Lepidium sativum</i>	219	1.5.1.0.8
Cucumber	<i>Cucumis sativus</i>	221	1.5.2.0.3
Currants (all varieties)	<i>Ribes</i> spp.	341	2.1.5.3
Custard apple	<i>Annona reticulata</i>	319	2.1.6.0.4
Dasheen	<i>Colocasia esculenta</i>	59	1.2.8
Dates	<i>Phoenix dactylifera</i>	313	2.1.6.0.5
Drumstick tree	<i>Moringa oleifera</i>	6229	2.2.3.8
Durra (sorghum)	<i>Sorghum bicolor</i>	14	1.1.5.2
Durum wheat	<i>Triticum durum</i>	11	1.1.1.1.1;
Earth pea	<i>Vigna subterranea</i>	79	1.3.9
Edo (eddoe)	<i>Xanthosoma</i> spp.; <i>Colocasia</i> spp.	59	1.2.8
Eggplant	<i>Solanum melongena</i>	222	1.5.2.0.4
Endive	<i>Cichorium endivia</i>	219	1.5.1.0.9
Fennel	<i>Foeniculum vulgare</i>	219	1.5.1.1.5
Fenugreek	<i>Trigonella foenum-graecum</i>	79	1.3.9
Fig	<i>Ficus carica</i>	314	2.1.6.0.6
Filbert (Hazelnut)	<i>Corylus avellana</i>	364	2.1.7.5
Fique	<i>Furcraea macrophylla</i>	9219	2.2.4.6
Flax for fibre	<i>Linum usitatissimum</i>	9213	1.4.4.2
Flax for oil seed (linseed)	<i>Linum usitatissimum</i>	9213	1.4.2.0.3
Formio (New Zealand flax)	<i>Phormium tenax</i>	9214	2.2.4.4

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Garlic, dry	<i>Allium sativum</i>	233	1.2.7
Garlic, green	<i>Allium sativum</i>	233	1.5.3.2
Geranium	<i>Pelargonium spp.</i> ; <i>Geranium spp.</i>	931	1.4.3.2
Ginger	<i>Zingiber officinale</i>	6225	2.2.3.4
Gooseberry (all varieties)	<i>Ribes spp.</i>	342	2.1.5.4
Gourd	<i>Lagenaria spp.</i> ; <i>Cucurbita spp.</i>	226	1.5.2.0.5
Gram pea (chickpea)	<i>Cicer arietinum</i>	73	1.3.4
Grape	<i>Vitis vinifera</i>	33	2.1.4
Grapefruit	<i>Citrus paradisi</i>	321	2.1.1.4
Grapes for raisins	<i>Vitis vinifera</i>	33	2.1.4.3
Grapes for table use	<i>Vitis vinifera</i>	33	2.1.4.2
Grapes for wine	<i>Vitis vinifera</i>	33	2.1.4.1
Grass esparto	<i>Lygeum spartum</i>	991	1.4.5.4
Grass, orchard	<i>Dactylis glomerata</i>	911	1.7.2.1
Grass, Sudan	<i>Sorghum bicolor var. sudanense</i>	911	1.7.2.1
Groundnut (peanut)	<i>Arachis hypogaea</i>	42	1.4.2.0.1
Guava	<i>Psidium guajava</i>	319	2.1.6.0.7
Guinea corn (sorghum)	<i>Sorghum bicolor</i>	14	1.1.5.2
Hazelnut (filbert)	<i>Corylus avellana</i>	364	2.1.7.5
Hemp fibre	<i>Cannabis sativa ssp. indica</i>	9213	1.4.4.3
Hemp, Manila (abaca)	<i>Musa textilis</i>	922	2.2.4.1
Hemp, sun	<i>Crotalaria juncea</i>	9213	1.4.4.5
Hempseed	<i>Cannabis sativa (marijuana)</i>	439	1.4.2.1.1
Henequen	<i>Agave fourcroydes</i>	922	2.2.4.2
Henna	<i>Lawsonia inermis</i>	911	1.4.5.4
Hop	<i>Humulus lupulus</i>	619	2.2.1.4
Horse bean	<i>Vicia faba</i>	72	1.3.2
Horseradish	<i>Armoracia rusticana</i>	239	1.5.3.8
Hybrid maize	<i>Zea mays</i>	12	1.1.3.1
Indigo	<i>Indigofera tinctoria</i>	991	1.4.5.4
Jasmine	<i>Jasminum spp.</i>	952	2.2.6.2
Jerusalem artichoke	<i>Helianthus tuberosus</i>	211	1.7.5.0.2
Jowar (sorghum)	<i>Sorghum bicolor</i>	14	1.1.5.2
Jute	<i>Corchorus spp.</i> (over 30 sp.)	9212	1.4.4.4
Kale	<i>Brassica oleracea var. acephala</i>	219	1.5.1.1.0
Kapok	<i>Ceiba pentandra</i>	922	2.2.4.3
Kenaf	<i>Hibiscus cannabinus</i>	9212	1.4.4.5
Kohlrabi	<i>Brassica oleracea var. gongylodes</i>	239	1.5.3.6
Lavender	<i>Lavandula spp.</i> (over 15 sp.)	931	1.4.3.2
Leek	<i>Allium ampeloprasum</i> ; <i>Allium porrum</i>	235	1.5.1.1.1
Lemon	<i>Citrus limon</i>	322	2.1.1.3
Lemon grass	<i>Cymbopogon citratus</i>	922	2.2.7.7
Lentil	<i>Lens culinaris</i>	75	1.3.5
Lespedeza (all varieties)	<i>Lespedeza spp.</i>	911	1.7.1.3
Lettuce	<i>Lactuca sativa var. capitata</i>	215	1.5.1.1.2
Lime, sour	<i>Citrus aurantifolia</i>	322	2.1.1.5
Lime, sweet	<i>Citrus limetta</i>	322	2.1.1.6
Linseed (flax for oil seed)	<i>Linum usitatissimum</i>	432	1.4.2.0.3
Liquorice	<i>Glycyrrhiza glabra</i>	931	1.4.3.3
Litchi	<i>Litchi chinensis</i>	319	2.1.6.1.5
Loquat	<i>Eriobotrya japonica</i>	359	2.1.2.5
Lupine (all varieties)	<i>Lupinus spp.</i>	76	1.3.9

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Macadamia (Queensland nut)	<i>Macadamia spp. ternifolia</i>	369	2.1.7.6
Mace	<i>Myristica fragrans</i>	6222	2.2.3.5
Maguey	<i>Agave atrovirens</i>	922	2.2.4.6
Maize (corn)	<i>Zea mays</i>	12	1.1.3
Maize (corn) for silage	<i>Zea mays</i>	12	1.7.3.1
Maize (hybrid)	<i>Zea mays</i>	12	1.1.3.1
Maize, ordinary	<i>Zea mays</i>	12	1.1.3.2
Mandarin	<i>Citrus reticulata</i>	324	2.1.1.2
Mangel (fodder beet)	<i>Beta vulgaris</i>	81	1.7.5.0.5
Mango	<i>Mangifera indica</i>	315	2.1.6.0.8
Manioc (cassava)	<i>Manihot esculenta</i>	53	1.2.3
Maslin (mixed cereals)	<i>Mixture of Triticum spp.; Secale cereale</i>	191	1.1.8
Medlar	<i>Mespilus germanica</i>	359	2.1.2.4
Melon (except watermelon)	<i>Cucumis melo</i>	225	1.5.2.0.1
Millet broom	<i>Sorghum bicolor</i>	18	1.4.5.4
Millet, bajra	<i>Pennisetum americanum</i>	18	1.1.5.1.2
Millet, bulrush	<i>Pennisetum americanum</i>	18	1.1.5.1.1
Millet, finger	<i>Eleusine coracana</i>	18	1.1.5.1.1
Millet, foxtail	<i>Setaria italica</i>	18	1.1.5.1.2
Millet, Japanese	<i>Echinochloa esculenta</i>	18	1.1.5.1.2
Millet, pearl (bajra, bulrush)	<i>Pennisetum americanum</i>	18	1.1.5.1.1
Millet, proso	<i>Panicum miliaceum</i>	18	1.1.5.1.1
Mint (all varieties)	<i>Mentha spp.</i>	6219	1.4.3.2
Mulberry for fruit (all varieties)	<i>Morus spp.</i>	39	2.1.6.1.5
Mulberry for silkworms	<i>Morus alba</i>	39	2.2.7.2
Mushrooms	<i>Agaricus spp.; Pleurotus spp.; Volvariella</i>	24	1.6.2.2
Mustard	<i>Brassica nigra; Sinapis alba</i>	433	1.4.2.0.6
Nectarine	<i>Prunus persica var. nectarina</i>	354	2.1.3.5
New Zealand flax (formio)	<i>Phormium tenax</i>	922	2.2.4.4
Niger seed	<i>Guizotia abyssinica</i>	434	1.4.2.1.1
Nutmeg	<i>Myristica fragrans</i>	6222	2.2.3.5
Oats, for fodder	<i>Avena spp. (about 30 sp.)</i>	17	1.7.3.2
Oats, for grain	<i>Avena spp. (about 30 sp.)</i>	17	1.1.6
Oil palm	<i>Elaeis guineensis</i>	443	2.2.2.2
Okra	<i>Abelmoschus esculentus</i>	229	1.5.2.0.6
Olive	<i>Olea europaea</i>	442	2.2.2.3
Onion seed	<i>Allium cepa</i>	234	1.8.5
Onion, dry	<i>Allium cepa</i>	234	1.2.6
Onion, green	<i>Allium cepa</i>	234	1.5.3.3
Opium	<i>Papaver somniferum</i>	931	1.4.3.3
Orange	<i>Citrus sinensis</i>	323	2.1.1.1
Orange, bitter	<i>Citrus aurantium</i>	323	2.1.1.6
Ornamental plants	<i>Various</i>	951	1.6.1.2
Palm palmyra	<i>Borassus flabellifer</i>	992	2.2.7.4
Palm, kernel oil	<i>Elaeis guineensis</i>	443	2.2.2.2
Palm, oil	<i>Elaeis guineensis</i>	443	2.2.2.2
Palm, sago	<i>Metroxylon sagu</i>	992	2.2.7.3
Papaya (pawpaw)	<i>Carica papaya</i>	316	2.1.6.0.9
Parsnip	<i>Pastinaca sativa</i>	239	1.5.3.8
Pea, edible dry, for grain	<i>Pisum sativum</i>	77	1.3.3
Pea, harvested green	<i>Pisum sativum</i>	77	1.5.4.2
Peach	<i>Prunus persica</i>	354	2.1.3.3
Peanut (groundnut)	<i>Arachis hypogaea</i>	42	1.4.2.0.1
Pear	<i>Pyrus communis</i>	355	2.1.2.2
Pecan nut	<i>Carya illinoensis</i>	369	2.1.7.6

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Pepper, black	<i>Piper nigrum</i>	6221	2.2.3.1
Pepper, dry	<i>Capsicum spp.</i> (over 30 sp.)	6211	1.4.3.1
Persimmon	<i>Diospyros kaki; Diospyros virginiana</i>	319	2.1.6.1.0
Pigeon pea	<i>Cajanus cajan</i>	78	1.3.7
Pineapple	<i>Ananas comosus</i>	317	2.1.6.1.1
Pistachio nut	<i>Pistacia vera</i>	365	2.1.7.6
Plantain	<i>Musa sapientum</i>	312	2.1.6.1.2
Plum	<i>Prunus domestica</i>	356	2.1.3.4
Pomegranate	<i>Punica granatum</i>	39	2.1.6.1.3
Pomelo	<i>Citrus grandis</i>	321	2.1.1.4
Poppy seed	<i>Papaver somniferum</i>	439	1.4.2.1.1
Potato	<i>Solanum tuberosum</i>	51	1.2.1
Potato, sweet	<i>Ipomoea batatas</i>	52	1.2.2
Prune	<i>Prunus domestica</i>	356	2.1.3.4
Pumpkin, edible	<i>Cucurbita spp.</i> (over 25 sp.)	226	1.5.2.0.
Pumpkin, for fodder	<i>Cucurbita spp.</i> (over 25 sp.)	226	1.7.5.0.3
Pyrethrum	<i>Chrysanthemum cinerariaefolium</i>	991	1.4.5.3
Quebracho	<i>Aspidosperma spp.</i> (more than 3 sp.)	992	2.2.5.3
Queensland nut	See <i>Macadamia</i>	369	2.1.7.6
Quince	<i>Cydonia oblonga</i>	355	2.1.2.3
Quinine	<i>Cinchona spp.</i> (more than 6 sp.)	932	2.2.7.5
Quinoa	<i>Chenopodium quinoa</i>	192	1.1.9
Radish	<i>Raphanus sativus</i> (inc. <i>Cochlearia armoracia</i>)	239	1.5.3.4
Ramie	<i>Boehmeria nivea</i>	922	2.2.4.5
Rapeseed (colza)	<i>Brassica napus</i>	435	1.4.2.0.5
Raspberry (all varieties)	<i>Rubus spp.</i> (over 360 sp.)	344	2.1.5.5
Red beet	<i>Beta vulgaris</i>	239	1.5.3.5
Redtop	<i>Agrostis spp.</i>	911	1.7.2.1
Rhea	<i>Boehmeria nivea</i>	922	2.2.4.5
Rhubarb	<i>Rheum spp.</i>	219	1.5.1.1.3
Rice	<i>Oryza sativa; Oryza glaberrima</i>	13	1.1.2
Rose	<i>Rose spp.</i>	952	2.2.6.1
Rubber	<i>Hevea brasiliensis</i>	94	2.2.5.1
Rutabaga (swede)	<i>Brassica napus var. napobrassica</i>	239	1.5.3.6
Rye	<i>Secale cereale</i>	16	1.1.7
Ryegrass seed	<i>Lolium spp.</i> (about 20 sp.)	991	1.8.4
Safflower	<i>Carthamus tinctorius</i>	436	1.4.2.0.9
Sainfoin	<i>Onobrychis viciifolia</i>	911	1.7.1.3
Salsify	<i>Tragopogon porrifolius</i>	239	1.5.3.8
Sapodilla	<i>Achras sapota</i>	39	2.1.6.1.4
Satsuma (mandarin/tangerine)	<i>Citrus reticulata</i>	324	2.1.1.2
Scorzoneria – black salsify	<i>Scorzoneria hispanica</i>	239	1.5.3.8
Sesame	<i>Sesamum indicum</i>	437	1.4.2.0.7
Shea butter (nut)	<i>Vitellaria paradoxa</i>	449	2.2.2.4
Sisal	<i>Agave sisalana</i>	922	2.2.4.2
Sorghum	<i>Sorghum bicolor</i>	14	1.1.5.2
Sorghum, broom	<i>Sorghum bicolor</i>	14	1.4.5.4
Sorghum, durra	<i>Sorghum bicolor</i>	14	1.1.5.2
Sorghum, Guinea corn	<i>Sorghum bicolor</i>	14	1.1.5.2
Sorghum, jowar	<i>Sorghum bicolor</i>	14	1.1.5.2
Sorghum, sweet	<i>Sorghum bicolor</i>	183	1.4.1.3
Soybean	<i>Glycine max</i>	41	1.4.2.0.2
Soybean hay	<i>Glycine max</i>	41	1.7.1.3
Spelt wheat	<i>Triticum spelta</i>	192	1.1.9
Spinach	<i>Spinacia oleracea</i>	216	1.5.1.1.4

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Squash	<i>Cucurbita spp.</i> (over 25 sp.)	226	1.5.2.0.8
Strawberry	<i>Fragaria spp.</i> (over 30 sp.)	345	2.1.5.6
Sugar beet	<i>Beta vulgaris</i>	81	1.4.1.2
Sugar beet for fodder	<i>Beta vulgaris</i>	81	1.7.5.0.6
Sugar beet for seed	<i>Beta vulgaris</i>	81	1.8.1
Sugarcane for fodder	<i>Saccharum officinarum</i>	82	1.7.5.0.7
Sugarcane for sugar or alcohol	<i>Saccharum officinarum</i>	82	1.4.1.1
Sugarcane for thatching	<i>Saccharum officinarum</i>	82	1.4.5.4
Sunflower for fodder	<i>Helianthus annuus</i>	438	1.7.5.0.4
Sunflower for oil seed	<i>Helianthus annuus</i>	438	1.4.2.0.4
Sunhemp	<i>Crotalaria juncea</i>	9213	1.4.4.5
Swede	<i>Brassica napus var. napobrassica</i>	239	1.5.3.6
Swede for fodder	<i>Brassica napus var. napobrassica</i>	239	1.7.5.0.8
Sweet corn	<i>Zea mays</i>	12	1.5.5.2
Sweet lime	<i>Citrus limetta</i>	322	2.1.1.6
Sweet pepper	<i>Capsicum annum</i>	6211	1.5.2.0.9
Sweet potato	<i>Lopmoea batatas</i>	52	1.2.2
Sweet sorghum	<i>Sorghum bicolor</i>	183	1.4.1.3
Tangerine	<i>Citrus reticulata</i>	324	2.1.1.2
Tannia	<i>Xanthosoma sagittifolium</i>	59	1.2.8
Tapioca (cassava)	<i>Manihot esculenta</i>	53	1.2.3
Taro	<i>Colocasia esculenta</i>	59	1.2.8
Tea	<i>Camellia sinensis</i>	612	2.2.1.3
Tef	<i>Eragrostis abyssinica</i>	192	1.1.9
Timothy	<i>Phleum pratense</i>	911	1.7.2.1
Tobacco	<i>Nicotiana tabacum</i>	96	1.4.5.1
Tomato	<i>Lycopersicon esculentum</i>	223	1.5.2.1.0
Trefoil	<i>Lotus spp.</i> (about 100 sp.)	991	1.8.6
Triticale for fodder	<i>Hybrid of Triticum aestivum and Secale cereale</i>	17	1.7.3.2
Tung tree	<i>Aleurites spp.; Fordii</i>	449	2.2.2.4
Turnip, edible	<i>Brassica rapa</i>	232	1.5.3.7
Turnip, for fodder	<i>Brassica rapa</i>	232	1.7.5.0.9
Urena (Congo jute)	<i>Urena lobata</i>	9214	1.4.4.5
Vanilla	<i>Vanilla planifolia</i>	6226	2.2.3.6
Vetch for grain	<i>Vicia sativa</i>	79	1.3.8
Walnut	<i>Juglans spp.</i> (over 20 sp.), <i>ep. regia</i>	366	2.1.7.3
Watermelon	<i>Citrullus lanatus</i>	224	1.5.2.1.1
Wheat	<i>Triticum aestivum</i>	11	1.1.1
Yam	<i>Dioscorea spp.</i> (over 120 sp.)	54	1.2.4
Yerba mate	<i>Ilex paraguariensis</i>	613	2.2.1.5

1. Crop codes used in 2000 agricultural census programme.

CLASSIFICATION OF LIVESTOCK

Group	Class	Title
1		Large ruminants
	11	Cattle
	12 13	Buffaloes Yaks
2		Small ruminants
	21 22	Sheep Goats
3		Pigs or swine
4		Equines
	41	Horses
	42	Mules and hinnies
	43 44	Asses Other equines (e.g., zebras)
5		Camels and camelids
	52 52	Camels Llamas and alpacas
6		Poultry
	61	Chickens
	62	Ducks
	63	Geese
	64	Turkeys
	65	Guinea fowls
	66 67	Pigeons Other poultry
7		Other animals
	71	Deer, elk, reindeer
	72	Fur-bearing animals such as foxes and minks
	73	Dogs and cats
	74 75	Rabbits and hares Other (e.g., ostriches, emus, elephants)
8		Insects
	81	Bees
	82 83	Silkworms Other worms or insects

CLASSIFICATION OF MACHINERY AND EQUIPMENT

Group	Class	Sub-class	Title	Types of machinery and equipment included
1			Manually-operated equipment	<ul style="list-style-type: none"> - Seed/fertilizer drill - Transplanter - Thresher - Winnowing - Sprayer - Duster - Hand pump or other hand irrigation devices
2			Animal-powered equipment	<ul style="list-style-type: none"> - Wooden plough - Steel plough - Cultivator - Disk harrow - Seed/fertilizer drill - Leveller - Animal cart - Animal-operated irrigation devices
3	31		Machine-powered equipment Machines for general farm use	<ul style="list-style-type: none"> - Internal combustion engine - External combustion engine - Electric generator - Electric motor - Computer used for farm management - Other electronic equipment used for farm management
	32		Tractors, bulldozers and other vehicles	<ul style="list-style-type: none"> - Track-laying tractor - Four-wheel tractor - Single-axle tractor - Bulldozer - Carryall - Truck - Boat - Other vehicle - Trailer
	33	331	Crop machinery and equipment <i>Land preparation and planting machinery and equipment</i>	<ul style="list-style-type: none"> - Power tiller - Plough - Rotary tiller - Rotary harrow - Disk harrow - Grain drill - Broadcast seeder - Seed/fertilizer drill - Cultivator - Planters - Levellers - Diggers - Land plane - Transplanter

Group	Class	Sub-class	Title	Types of machinery and equipment included
		332	<i>Crop maintenance machinery and equipment</i>	<ul style="list-style-type: none"> - Manure spreader - Fertiliser broadcaster - Sprayer - Duster - Water pump - Sprayers and other localized irrigation devices - Other irrigation equipment
		333	<i>Crop harvesting machinery and equipment</i>	<ul style="list-style-type: none"> - Mower for grass crops - Hayrake - Haybaler - Forage harvester - Forage blower - Combine harvesters - Corn picker - Digger, potato harvester - Sugar beet harvester - Reaper-binder
		334	<i>Post-harvest machinery and equipment</i>	<ul style="list-style-type: none"> - Thresher - Grain cleaner - Sorters and graders
	34		Livestock machinery and equipment	<ul style="list-style-type: none"> - Milking machine - Milk cooler - Cream separator - Incubator
	35		Aquacultural machinery and equipment	

GLOSSARY OF TERMS

Activity status: see *economic activity status*.

Agricultural census: collection of structural data from agricultural holdings.

Agricultural holder: person making the major decisions on the operations of the holding (paragraph 3.36). See also *co-holder*.

Agricultural holding: economic unit of agricultural production – the basic unit of enumeration in the agricultural census (paragraphs 3.23–3.35).

Agricultural household: a household whose largest source of income consists of income derived from agricultural production (paragraph 11.212).

Agricultural land: the total of arable land, permanent crops, and permanent meadows and pastures (paragraph 11.38).

Agro-forestry: farm management system involving growing trees in conjunction with crops and livestock production (paragraphs 11.318–11.319).

Aquacultural census: collection of structural data from all aquacultural production units.

Aquacultural holding: an economic unit of aquacultural production under single management (paragraph 7.9).

Aquaculture: farming of aquatic organisms including fish, crustaceans, molluscs, and aquatic plants (paragraphs 11.293–11.295).

Arable land: land used in most years for growing temporary crops (paragraph 11.38).

Associated crops: temporary crops growing together on the same piece of land with permanent crops in compact plantation (paragraphs 11.109, 11.121).

Census: statistical collection involving the enumeration of all units (large sample-based collections are sometimes also referred to censuses).

Census core module: the primary agricultural census collection to provide key structural data, carried out on a complete enumeration or large sample basis (paragraph 1.16).

Census of agriculture and aquaculture: an agricultural census and an aquacultural census conducted as a combined field operation (paragraph 7.7).

Census supplementary module: a sample-based module undertaken in association with the core census module, to provide more detailed structural data than in the core module (paragraph 1.16).

Classification: collection or presentation of data in classes in a structured format, such as occupation groupings.

Co-holder: person jointly making the major decisions on the operations of the holding with another person (paragraph 3.37). See also *agricultural holder*.

Compact plantation (permanent crop): plants and trees planted in a regular or systematic manner (paragraph 11.96).

Complete enumeration: collection of data from all units, rather than from just a sample of units.

Core module: see *census core module*.

Current agricultural statistics: ongoing agricultural statistics on such things as production and prices, as opposed to structural data collected in the agricultural census.

Double cropping: see *successive crops*.

Drainage: removal of excess water to improve agricultural productivity (paragraphs 11.89 –11.90).

Economic activity status: a classification describing a person as employed, unemployed or not economically active (paragraphs 11.226–11.231).

Economically active: a person who is either employed or unemployed (paragraph 11.227).

Educational attainment: highest level of education achieved by a person (paragraphs 11.224–11.225).

Employed: a person with paid work or in self-employment (paragraph 11.235).

Employee: a person in paid employment (paragraph 11.242).

Enumeration area (EA): small geographic unit defined for census enumeration purposes (paragraphs 3.60–3.61).

Establishment: an economic unit operating in a single location, mainly engaged in a single productive activity (Appendix 1).

Enterprise: an economic unit under single management consisting of one or more than one establishment (Appendix 1).

Fertilizers: substances that supply plants with nutrients or enhance plant growth, containing at least 5% of the three primary nutrients (N, P₂O₅ and K₂O) (paragraph 11.130).

Field: piece of land in a parcel separated by easily recognizable demarcation lines (paragraph 11.54).

Food security: see *household food security*.

Forest: land with trees of height 5 metres or more with crown cover of more than 10% (paragraph 11.35).

Frame: the basis used for identifying all the statistical units to be enumerated in a statistical collection (paragraphs 3.53–3.63).

Genetically Modified Organism: organism containing genetic material obtained through the use of modern biotechnology (paragraph 11.183).

Good Agricultural Practices: practices that ensure agricultural products are of high quality, safe, and produced in an environmentally and socially responsible way (paragraph 11.178).

Gross cropped area: the total area of all temporary crops cropped, as opposed to the physical area of land cropped (paragraph 11.28). See also *net cropped area*.

Holder: see *agricultural holder*.

Holding: see *agricultural holding*.

Household: group of people living together, making common arrangements for food and other essentials of living (paragraphs 3.26–3.27).

Household food security: the situation where all members of a household at all times are consuming enough safe and nutritious food (paragraph 11.269).

Industry: the activity of the establishment in which an employed person works.

Integrated statistical programme: in the context of agricultural censuses, the development of the agricultural census as the central component of the agricultural statistics system.

Inter-planted crops: one temporary crop planted between rows of another temporary crop (paragraph 11.106).

Irrigation: purposely providing land with water, other than rain, for agricultural purposes (paragraphs 11.69–11.71).

Item: a particular characteristic being measured in the agricultural census.

ISIC: International Standard Industrial Classification of All Economic Activities (Appendixes 1, 2).

Landless holding: agricultural holding with no land (paragraph 11.41).

Land tenure: arrangements under which a holder operates land on a holding (paragraphs 11.47–11.51).

Land use: classification of land according to the activity undertaken on the land (paragraphs 11.20–11.39).

Legal status of holder: juridical aspects under which an agricultural holding is operated (paragraph 11.7)

Livestock: animals (including birds and insects) kept or reared in captivity mainly for agricultural purposes (paragraph 11.149).

Livestock census: enumeration of livestock holdings undertaken in some countries separately from the agricultural census.

Mineral fertilizers: fertilizers manufactured from inorganic materials (paragraph 11.132).

Mixed cropping: several temporary crops grown simultaneously as a mixture on the same piece of land (paragraphs 11.107–11.108).

Module: a separate component of the agricultural census – a modular approach is used for the agricultural census, with core and supplementary modules (paragraph 1.15).

Multi-stage sampling: sampling scheme in which the sample is selected in stages (paragraph 10.7). See also *single-stage sampling*.

National accounts: summary of national income and product statistics, including Gross Domestic Product (Appendix 1). See also *System of National Accounts*.

Net cropped area: the physical area of land cropped, as opposed to the sum of the individual cropped areas, including successive plantings (paragraph 11.28). See also *gross cropped area*.

Non-sampling errors: all types of errors in statistics, other than sampling errors, including data collection errors, reporting errors, and data processing mistakes. See also *sampling errors*.

Occupation: a classification of the type of work done by a person – not to be confused with the industry in which a person works (paragraphs 11.247–11.252).

Organic agriculture: agricultural production system based on specific standards for achieving socially, ecologically and economically sustainable agro-ecosystems (paragraphs 11.180–11.182).

Organic fertilizers: fertilizers prepared from processed plant and animal material (paragraph 11.134).

Other wooded land: land with tree/shrub/bush cover less than that required to be classified as a forest (paragraph 11.35).

Own-account agricultural production: a household characteristic, indicating that the household contains one or more agricultural holdings (paragraph 3.28).

Parcel: piece of land of one tenure type entirely surrounded by other land not operated by the holding or by other parcels of the holding under a different tenure type (paragraphs 11.53–11.54).

Permanent crops: long-term crops that do not have to be re-planted for several years (paragraph 11.33).

Pesticide: substances intended to repel, mitigate, control or destroy diseases and pests in plants or animals and to prevent any harm to agricultural commodity during production, storage, transport, processing and marketing etc. (paragraphs 11.176–11.177).

Plot: part or whole of a field on which a specific crop or crop mixture is grown (paragraph 11.54).

Population census: the collection of demographic and socio-economic data for all persons in a country, normally undertaken every ten years.

Programme of agricultural surveys: in the context of the agricultural census, agricultural surveys carried out based on the agricultural holding unit from the agricultural census (Chapter 9).

Random sampling: sampling method used for sample surveys, in which each unit within the scope of the survey has a fixed, but not necessarily the same, probability of selection in the sample (paragraph 10.2).

Reference period: the time period to which a given data item collected in a census or survey refers – for example, an agricultural year for crops; the day of enumeration for livestock (paragraphs 3.72–3.74).

Rural household: household living in an area designated as a rural area, often determined from the population census (paragraph 8.10).

Sample survey: the collection of data from a sample of units, rather than all units as in a census.

Sampling errors: the errors in statistics obtained from a sample survey because data are collected from only a sample of units. See also *non-sampling errors*.

Sampling frame: the means by which all in-scope units are identified for a sample survey (Chapter 10).

Scattered plants (permanent crops): plants and trees scattered around a holding and so preventing estimation of the area (paragraph 11.123).

Scope: the geographical area or types of units covered by a statistical collection (paragraphs 3.6–3.15).

Sector: the institutional category (such as household, corporation, cooperative, government) to which the holding belongs (paragraphs 11.7–11.10).

Shifting cultivation: cultivation whereby land is cultivated for some years before being abandoned (paragraph 11.60).

Single-stage sampling: sampling scheme in which the sample is selected directly from a list of units covered by the survey (paragraph 10.7). See also *multi-stage sampling*.

SNA: see *System of National Accounts*.

Soil degradation: decline in soil quality caused by natural processes or improper use by humans (paragraphs 11.64–11.65).

Statistical unit: the unit for which data are collected in a census or survey – the agricultural holding is the main statistical unit for the agricultural census.

Status in employment: the classification of a job held by a person according to whether it is as an employee, own-account worker, etc. (paragraphs 11.241–11.246).

Stunting: refers to the situation where the height of a child is too low for his/her age (paragraph 11.290).

Structural data: data on the basic organizational structure of agricultural holdings that do not change quickly over time, such as farm size and land use.

Sub-holder: a person to whom the holder delegates the authority to sub-manage a sub-holding (paragraph 3.45).

Sub-holding: a part of a holding managed by a particular person in the household (paragraphs 3.44).

Successive crops: two or more temporary crops grown successively on the same piece of land at different times during the year (paragraphs 11.104–11.105).

Supplementary module: see *census supplementary module*.

Survey: see *sample survey*.

System of National Accounts (SNA): an international national accounting framework for reporting national income and product statistics (Appendix 1).

Table: the primary output of a statistical collection, involving the summarizing of results in tabular form.

Tabulation programme: programme of the output tables to be produced from a statistical collection (Chapter 12).

Temporary crops: crops with a less than one-year growing cycle (paragraphs 11.27–11.28).

Theme: the broad subject heading describing the content of a census supplementary module or an agricultural survey.

Underweight: refers to the situation where a child's weight is too low for his/her age (paragraph 11.290).

Unemployment: a situation where a person of working age is: (i) without work, (ii) available for work, and (iii) seeking work (paragraphs 11.237–11.239).

Wasting: refers to the situation where a child's weight is too low for his/her height (paragraph 11.290).

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