

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.