

## 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-making<sup>1</sup>

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.

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<sup>1</sup> 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.