Food and Agriculture Organization of the United Nations

FAO STATISTICAL DEVELOPMENT SERIES 15

WORLD PROGRAMME FOR THE CENSUS OF AGRICULTURE 2020

VOLUME 1

Programme, concepts and definitions

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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ACRONYMS

AFCAS	African Commission on Agricultural Statistics
AGRIS	Agriculture Integrated Survey
APCAS	Asia and Pacific Commission on Agricultural Statistics
CAPI	Computer-Assisted Personal Interview
CASI	Computer-Assisted Self Interviewing
CATI	Computer-Assisted Telephone Interview
CPC	Central Product Classification
DDI	Data Documentation Initiative
EA	Enumeration Area
EEZ	Exclusive Economic Zones
FAO	Food and Agriculture Organization of the United Nations
FAO-OEA/CIE-IICA	Working group on agricultural and livestock statistics for Latin America and the Caribbean
FIES	Food Insecurity Experience Scale
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GM	Genetically Modified
GMCCs	Green Manure/Cover Crops
GPS	Global Positioning System
HS	Harmonized Commodity Description and Coding System
ICC	Indicative Crop Classification
ICLS	International Conference of Labour Statisticians
ICSE	International Classification of Status in Employment
IFOAM	International Federation of Organic Agricultural Movements
IHSN	International Household Survey Network
IIA	International Institute of Agriculture
ILO	International Labour Organization
ISCED	International Standard Classification of Education
ISIC	International Standard Industrial Classification of All Economic Activities
ISSCFG	International Standard Statistical Classification of Fishing Gears
LSMS	Living Standards Measurement Survey
LU	Land Use

LULUCF	Land Use, Land Use Change and Forestry
MAPS	Marrakech Action Plan for Statistics
MDG	Millennium Development Goal
MSF	Master Sampling Frame
NSDS	National Strategies for the Development of Statistics
PAPI	Paper and Pen Interview
PES	Post Enumeration Survey
PGS	Participatory Guarantee Systems
PUF	Public Use Files
RAF	Remote Access Facilities
SDC	Statistical Disclosure Control
SDG	Sustainable Development Goals
SDMX	Statistical Data and Metadata eXchange
SDS	Statistical Development Series
SEEA	System of Environmental-Economic Accounting
SMS	Short Message Service
SNA	System of National Accounts
SPARS	Strategic Plan for the Development of Agricultural and Rural Statistics
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UNSC	United Nations Statistical Commission
VoH	Voices of the Hungry
WCA	World Programme for the Census of Agriculture
WHO	World Health Organization

FOREWORD

The census of agriculture is one of the key pillars of a national statistical system, and in many developing countries it is often the only means of producing statistical information on the structure and other relevant aspects of the agriculture sector. Moreover, it is the only data collection instrument that produces statistical information on farms at the lowest geographical level and therefore it is an essential source of information for governments and decision-makers in member countries.

One of the most important elements of FAO's statistical work is the development and promotion of the decennial World Programme for the Census of Agriculture. Since the founding of FAO in 1945, it has supported countries to carry out their national agricultural censuses using standard international concepts, definitions and methodologies. The World Programme for the Census of Agriculture 2020 (WCA 2020) is the tenth decennial programme, and is expected to provide the basis for implementation of agricultural censuses in FAO member countries between 2016 and 2025. The use of these guidelines by member countries ensures that the census results are harmonized and internationally comparable, and allows countries to benchmark their performance against others.

These guidelines are unique because they not only build on past experiences and lessons learned, but they also look forward and take the emerging data needs of users into consideration. They address requirements of both developed and developing countries, and provide the foundation for countries to develop an integrated census and survey programme, to use innovative and cost-effective methodologies, and ultimately to make better informed strategic decisions.

In this publication, close linkages have been established with the "Global Strategy to Improve Agricultural and Rural Statistics", in terms of contribution to the minimum set of core data and the establishment of master sampling frames. The increased importance of integrating agricultural statistics in national statistical systems is also underlined. In addition, the guidelines examine alternative census methodological approaches, and the growing use of innovative methods and information technologies for data collection, processing and dissemination.

The WCA 2020 has been carefully reviewed by countries and key stakeholders, including internal users at FAO, external users in the regions and national and international experts on agricultural statistics. These reviews and consultations have provided critical feedback for development of the guidelines in terms of methodology and content. Consultation with member countries has been particularly important, and has helped to ensure that the guidelines are tailored to country needs.

The WCA 2020 has been prepared by the Statistics Division of FAO, in collaboration with many other divisions and census experts from all over the world. The hope is that member countries will find that these guidelines provide a strong foundation for conducting their national censuses of agriculture, and that this harmonized approach will ultimately lead to improved understanding of the agricultural sector in the future.

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EXECUTIVE SUMMARY

The Food and Agriculture Organization of the United Nations (FAO) is the leading United Nations agency providing guidelines for the conduct of agricultural censuses worldwide. This publication provides updated guidelines to countries for the conduct of agricultural censuses in the 2020 census round, which covers the period between 2016 and 2025. It is the tenth round in the decennial programme of agricultural censuses, which started in 1930.

It is recognized that countries use a range of census methodological approaches according to their circumstances, development levels and needs. A review of experiences and lessons learned in the 2010 census round showed that the census of agriculture can be conducted in many different ways. This publication features the discussion of four modalities for conducting a census of agriculture: *the classical (one-off) approach*, which is still widely used; *the modular approach,* which was introduced in the World Programme for the Census of Agriculture (WCA) 2010; *the integrated census/survey modality*, involving rotating survey modules over the years between two censuses; and *the combined census modality*, which uses administrative data. The distinguishing features are in the design of these four modalities and not in whether complete or sample enumeration is used.

Another important feature of the WCA 2020 is the reintroduction of the notion of "essential" items, and a clear distinction between "essential" items and "frame" items. It is recommended that all countries collect the essential items regardless of the census modality. The frame items are intended primarily for inclusion in the core module of a census using the modular approach, to provide data for the frames for the supplementary modules or follow-up surveys. In addition to the essential and frame items, other items, referred to as "additional" items, are presented in the census programme. These are provided for countries wishing to collect more in-depth (supplementary) data on specific themes and are suitable for inclusion irrespective of the approach adopted for the census.

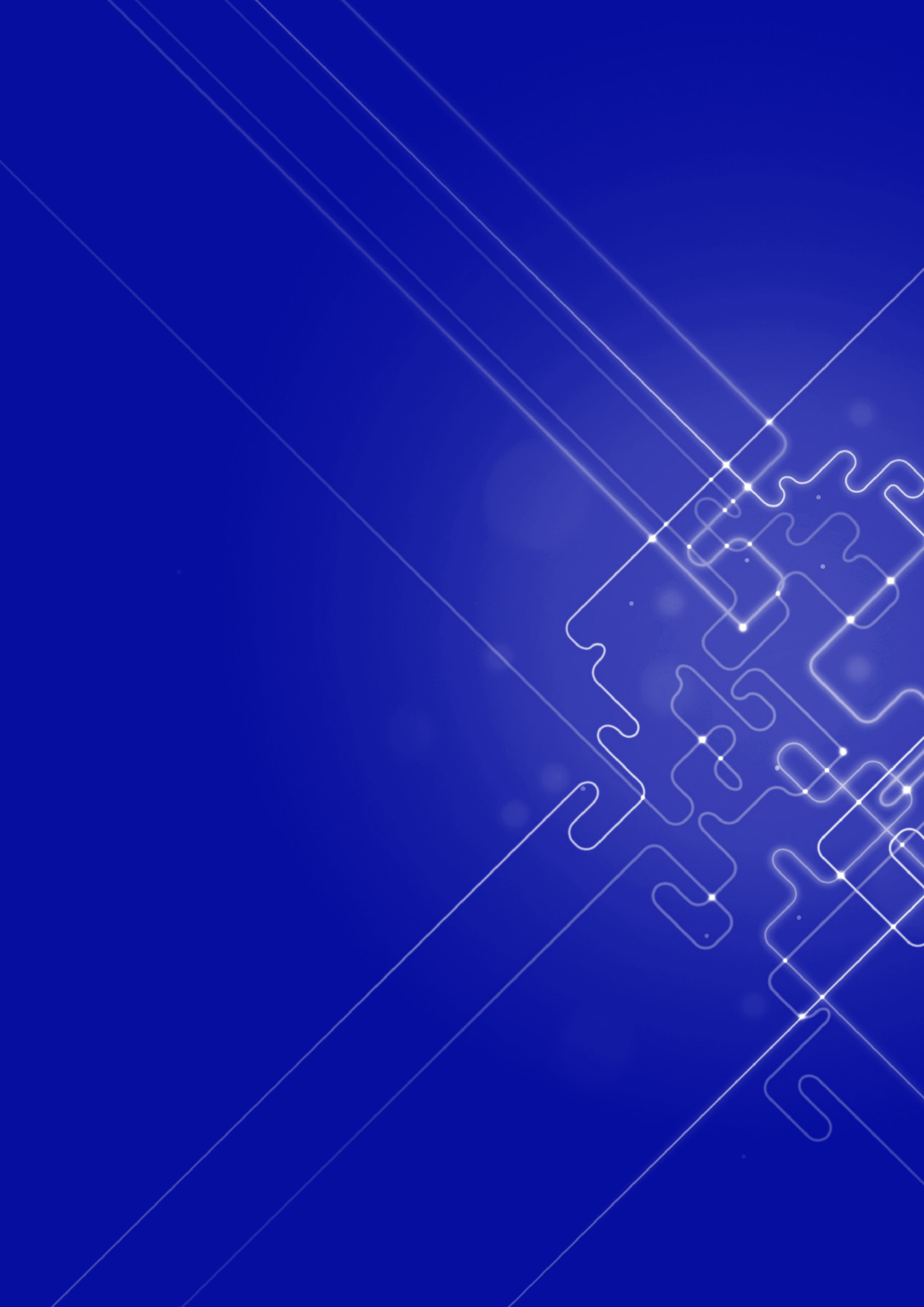
The new WCA 2020 programme maintains key features introduced in the previous programme, namely the close relationship between the population and housing census and the agriculture census, the possibility of collecting community-level data on the infrastructure and services available to agricultural holdings, and the collection of sex-disaggregated data in the agricultural census. For this latter, the WCA 2020 has improved the approach for assessing the distribution of managerial decisions and introduced the identification of ownership within the household. The new programme also provides a revised list of themes and data items to better address emerging data needs, including two new themes: "Fisheries" (capture fisheries activities conducted at household level) and "Environment/Green House Gases (GHG)" (basic agro-environmental data on GHG and ammonia emissions).

There is an increased use of information technology not only in data collection and processing but also in dissemination. The publication emphasizes that the increasing use of technology in census operations such as computer-assisted personal interviewing (CAPI) has the potential to lead to improvements in data quality and reduces the time lag between data collection and data analysis. Similarly, the use of interactive outputs and web-based data (tables, graphs, maps), as well as access to anonymized micro-data, has brought new opportunities for census dissemination. User-friendly dissemination tools support informed decision-making, unleash the analytical creativity of users and elevate the value of census data for agricultural policy purposes, research and business, in addition to the usual statistical uses.

Countries are expected to adopt the WCA 2020 guidelines for conducting their national census of agriculture. The use of the standards, concepts and definitions proposed by these guidelines will ensure the international comparability of the data collected, and the possibility for countries to benchmark their performance against other countries. Adopting the guidelines will also help countries to develop an integrated census and survey programme, use innovative and cost-effective methodologies, and broaden the dissemination of census data for informed strategic decisions.

PART ONE

The census of agriculture in context



CHAPTER 1
INTRODUCTION

This chapter provides historical background on the World Programme for the Census of Agriculture 2020 (WCA 2020) and presents the objectives of the agricultural census. The programme considers four modalities for conducting a census of agriculture, namely, the classical approach which is still widely used, the modular approach which was introduced in the 2010 census round, the integrated census/survey modality and the combined census modality with use of administrative data. The programme highlights the synergies with the "Global Strategy to Improve Agricultural and Rural Statistics" (2010) which underlines the importance of the census for the integration of agriculture into a country's national statistical system. Thus, the integration of the census of agriculture into the overall system of agricultural statistics is further emphasized. The main features and 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 a country. Typical structural data collected in a census of agriculture are size of holding, land tenure, land use, crop area, irrigation, livestock numbers, labour and other agricultural inputs. In an agricultural census, data are collected at the holding level, but some community-level data may also be collected.

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 (WCA) 2020, covering agricultural censuses to be carried out by countries between 2016 and 2025. It is the tenth 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, 2000 and 2010 – were promoted by the Food and Agriculture Organization of the United Nations (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 on 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 organized, 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, recruitment and training were major concerns when professional staff members 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 more restricted content, concentrating on the structural aspects of agriculture such as farm size, land use, crop areas 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, for example, gave special emphasis to aquaculture, employment and the environment. The requirement to undertake censuses in all countries in the same year was also relaxed. To help countries meet the need for a wider range of data from the agricultural census, while minimizing the cost of census-taking, the 2010 census round introduced the modular approach. This approach consisted of 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. A list of 16 items was recommended for the core module (as a minimum set of data) not only for collecting key structural data but also for use in creating sampling frames for the census supplementary modules or for the programme of agricultural surveys. In developing the series of agricultural census programmes, FAO recognizes that countries are at different stages of economic and statistical development. Each country has therefore been encouraged to develop and implement its census of agriculture tailored to its unique situation, but to be mindful of the need to collect a minimum set of data for international comparison purposes.

Objectives of the census of agriculture

1.5 Historically, 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. Agricultural censuses have also been used to provide benchmarks to improve current crop and livestock statistics and to provide sampling frames for follow-up agricultural sample surveys. Previous agricultural censuses have focused on the activities of agricultural production units – that is, holdings or other units operating land or keeping livestock. They have not been seen as censuses of rural households.

1.6 Since agricultural censuses are usually undertaken only every ten years, it is natural to associate them with those aspects of agriculture that change relatively slowly over time. Some national censuses of agriculture, however, are conducted at five-year intervals, which can provide more up-to-date structural data for agricultural policy purposes. Thus, agricultural censuses are mainly concerned with data on the basic organizational structure of agricultural holdings, such as size of holding, land tenure, land use, crop area, irrigation, livestock numbers, labour, use of machinery and other agricultural inputs. Agricultural censuses have not normally included data that change from year to year, such as agricultural production or agricultural prices.

1.7 The basic objectives of the census of agriculture have remained relevant over the past few agricultural census rounds. For WCA 2020, the objectives of the agricultural census are:

- To provide data on the structure of agriculture, especially for small administrative units, and to enable detailed cross-tabulations;
- To provide data to use as benchmarks for and reconciliation of current agricultural statistics;
- To provide frames for agricultural sample surveys.

1.8 One development since the 2010 agricultural census programme has been the "Global Strategy to Improve Agricultural and Rural Statistics" (see Chapter 2). An additional objective of the WCA 2020 is to contribute significantly to the Global Strategy's objectives, in particular to pillars 1 and 2, both as a source for the minimum set of core data and for the development of a master sampling frame (MSF).

The census of agriculture in an integrated agricultural statistics system

1.9 In recent years, increasing efforts have been made towards achieving 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.

1.10 The data requirements for food and agriculture are extensive and include information on the structure of agricultural holdings, agricultural production, farm management, agricultural inputs, food consumption, household income and expenditure, labour force and agricultural prices. These data could come from agricultural censuses, agricultural sample 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 data required.

This approach is being promoted by the "Global Strategy to Improve Agricultural and Rural Statistics" (see paragraphs 2.11-2.17 and 4.13 - 4.16)

1.11 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 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.

1.12 Agricultural censuses and agricultural surveys are closely related in that both involve the collection of data about agricultural production units. Therefore, the agricultural census has a key role to play in 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. In an integrated agricultural statistics system, the census of agriculture provides: (i) 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; and (ii) sampling frames for the agricultural surveys (that are part of the system) which are conducted more frequently to provide in-depth and timely data.

1.13 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 producers and users 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 between the various agencies is paramount. However, this is sometimes difficult because each agency may have a different mandate regarding the purpose, scope and timing of its work.

1.14 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 support the long-term goal of providing a continuous flow of timely and accurate data covering all aspects of food, agriculture and rural development. Conducting an agricultural census using the modular approach (see paragraphs 4.6 – 4.8) could be an important step in this direction because the modular approach can be seen as a transition to the integrated system of the agricultural census and surveys.

1.15 In WCA 2020, as in the previous programme, emphasis has been given to developing the agricultural census within the overall framework of the system of integrated agricultural censuses and surveys. Countries with an established system of agricultural surveys may choose the classical approach (see paragraphs 4.4 – 4.5) for obtaining benchmark structural data and updating frames for the surveys, while countries with no such system and limited budget may choose the modular approach as the first step towards creation of a system of integrated agricultural censuses and surveys.

Main features of WCA 2020

1.16 The WCA 2020 has been envisaged in two volumes to clearly separate two distinct aspects of the census. Volume 1, "Programme, Concepts and Definitions", deals with the methodological and conceptual aspects of the census of agriculture, while Volume 2, will deal with the practical details on the steps involved in actually conducting an agricultural census. Volume 2 is a revised and updated edition of Conducting Agricultural Censuses and Surveys (FAO, 1996a).

1.17 One of the main features of the new programme is the role it plays in supporting the "Global Strategy to Improve Agricultural and Rural Statistics" (2010). The census of agriculture is one of the key elements of the Global Strategy, as a source for the minimum set of core data and information (first pillar of the Global Strategy) and for the integration of agriculture into the national statistical system through a master sample frame and an integrated survey system (second pillar).

1.18 The programme further emphasizes the integration of the agricultural census within the overall framework of the system of integrated agricultural censuses and surveys through the approach to be taken. It is recognized that countries use a range of methodological approaches to the census according to their circumstances, development levels and needs. In this light, the WCA 2020 features discussion of four modalities for conducting a census, including the two most common census methodological approaches – namely, the classical approach, which is still widely used, and the modular approach introduced in the previous census round as a cost-effective approach to collecting a wider set of data. In addition, two new modalities are introduced: the integrated census/survey modality and the combined census modality with use of administrative data.

1.19 A new feature of the WCA 2020 is the re-introduction of the notion of essential items, making a clear distinction between "essential" items and "frame" items. It is recommended that all countries collect the essential items regardless of their approach to the agricultural census. The frame items are intended primarily for inclusion in the core module of a census using the modular approach, to provide data for the frames for the supplementary modules or follow-up surveys. In addition to the essential and frame items, other items, referred to as "additional" items, are presented in the census programme. These are provided for countries wishing to collect more in-depth (supplementary) data on specific themes and are suitable for inclusion irrespective of the approach adopted for the census. The programme includes some new themes and items to cover the data needs expressed by countries and users (see paragraph 1.26).

1.20 Another feature of the WCA 2020 guidelines is an increased emphasis on the use of information technology in data collection, processing and dissemination. The increasing use of technology in census and surveys operations results in significant efficiencies and reduces the time lag between data collection and data analysis. This includes the use of computer-assisted personal interviewing (CAPI), internet-based data collection methods and geo-referencing. Similarly, the use of interactive outputs and web-based data (tables, graphs, maps), as well as access to anonymized micro-data, has brought new opportunities for census dissemination. Novel and user-friendly dissemination tools support informed decision-making, unleash the analytical creativity of users and ensure greater sustainability of agriculture statistics and their integration into the broader national statistical system.

1.21 The programme has retained three key features introduced in the previous programme. Firstly, the relationship between the population and housing census and the agriculture census is re-emphasized. The integration of these two operations is further elaborated in a joint publication by FAO and the United Nations Population Fund (2012). Secondly, the possibility to collect community-level data remains in the programme due to the strong demand for, and increased use of, this kind of data vis-a-vis the marginal field cost. Community-level data is collected with a view to building an information base on the infrastructure and services available to agricultural holdings. Thirdly, the recommendation to collect sex-disaggregated data in the census is retained. At the same time, the approach has been improved to facilitate the collection of such data.

1.22 The main features of Volume 1 of the census guidelines highlighted above are the result of a review of countries' experiences under the WCA 2010 round, through extensive consultations with countries as well as global and regional experts and the recognition of new and emerging needs. As in the past, it is expected that countries will adapt the guidelines given in this publication to meet national needs.

Main changes in WCA 2020

1.23 WCA 2020 has been developed after a review of countries' experiences with the 2010 programme and an assessment of changing data needs in the light of developments in agricultural practices.

The main methodological differences between the 2010 and 2020 programmes are highlighted in the previous section (see paragraphs 1.16-1.22). Specific changes to statistical units, concepts and definitions, data content and classifications are summarized below:

1.24 ***Statistical unit***

- The statistical unit for the agricultural census, the agricultural holding, remains the same as used in previous programmes (see paragraph 6.1).
- The concept of an aquacultural holding remains the same as used in the previous programme (see paragraph 5.21).

1.25 ***Concepts and definitions***

- The definition of an agricultural holder remains the same as in the previous programme (see paragraphs 6.17-6.21). Some clarification has been provided in the definition.
- Two concepts introduced in the 2010 census programme – the subholding and the subholder – have been omitted, as the approach to measuring the role of household members, especially women, in the management of the holding has been revised (see paragraphs 8.10.5 – 8.10.19).
- Forest and other wooded land has been re-defined to bring them into line with the System of Environmental-Economic Accounting (SEEA) Central Framework adopted by the United Nations Statistical Commission (UNSC) in 2012 (see paragraph 8.2.28 – 8.2.31).
- Work concepts have been updated to be consistent with the resolution adopted by the International Labour Organization (ILO) in 2013 (ILO, 2014) (see paragraphs 8.9.6 – 8.9.14).

1.26 ***Data content***

- In the 2010 programme, FAO provided a list of items under two headings, according to their suitability for the core and supplementary modules of the modular approach. As noted earlier, the 2020 programme discusses four modalities for conducting a census of agriculture and introduces three categories of census items: essential, frame and additional. The essential items are those that are imperative for national purposes and international comparability, which all countries are recommended to collect, regardless of their approach to the census. The frame items relate primarily to the modular approach and are those items collected in the core module and deemed necessary for the establishment of frames for supplementary census modules or follow-up surveys. Other more detailed items in the census programme are referred to as additional items, which can be collected with any census modality.
- A number of changes to the list of census items are included in the 2020 agricultural census programme. Some of the items are new, some are reintroduced and some are components of existing items (see Chapter 7 for more details):
    - ***Identification and general characteristics:*** respondent for the agricultural holding (reintroduced); proportion of income from holding's agricultural production; main agricultural activity of the holding; presence of hired manager (reintroduced); sex of the hired manager; age of the hired manager.
    - ***Land:*** land use (for each parcel).
    - Irrigation: area of land actually irrigated (component); area equipped for irrigation in working order.
    - ***Crops:*** presence of nurseries (component); presence of cropped land under protective cover (component).
    - ***Livestock:*** number of female breeding animals (component).
    - ***Agricultural practices:*** use of genetically modified seeds (component); type of seed for each major crop type; source of seed inputs for each major crop type; types of tillage practices; presence of conservation agriculture; presence of soil conservation practices.
    - ***Demographic and social:*** agricultural training/education of holder.
    - ***Work on the holding:*** whether working on the holding is the main activity.

- ***Intrahousehold distribution of decision-making and ownership:*** sex of household members making managerial decisions; area of crops by sex of the person managing them; number of livestock by sex of the person managing them; area of land owned by sex of the owner; number of livestock owned by sex of the owner.
- ***Household food security:*** the food insecurity experience scale (Item 1101).
- ***Fisheries:*** a new theme (Items 1401-1407)
- ***Environment/greenhouse gas (GHG) emissions:*** a new theme (Items 1501-1509)
- ***Community-level data:*** communal area under water used for aquaculture.

◆ Several items from the 2010 programme have been ***modified*** in the 2020 programme:

- ***Identification:*** A number of existing items related to the identification and location of the agricultural holding have been conveniently combined in this theme.
- ***Land:*** The item "land tenure types on the holding" was modified as 0203 "area of holding according to land tenure types"; and the item "presence of shifting cultivation" was modified as 0209 "use of shifting cultivation".
- ***Irrigation:*** The following items were reworded: "presence of irrigation on the holding" as 0301 "use of irrigation on the holding"; "area of land irrigated according to land use type" as 0303 "area of land actually irrigated according to land use type"; "area irrigated according to method of irrigation" as 0304 "area of land actually irrigated according to method of irrigation"; "area irrigated for each crop type" as 0305 "area of crops actually irrigated for each crop type"; "other types of water management practices" as 0308 "use of other types of irrigation".
- ***Crops:*** "number of permanent crop trees in compact plantation and scattered plantings" as 0407 "number of permanent trees in scattered plantings"
- ***Livestock:*** "type of livestock production system" as 0501 "type of livestock system".
- ***Agricultural practices:*** "use of genetically modified crops according to crop type" as 0603 "use of genetically modified seeds according to crop type".
- ***Services for agriculture:*** "sources of agricultural extension services" as 0706 "sources of agricultural extension services used"; "travelling time to nearest periodic or permanent agricultural produce market" as 0707 "travelling time to nearest periodic or permanent agricultural produce market for selling products".
- ***Demographic:*** "household size" as 0801 "household size by sex and age groups".
- ***Work on the holding (formerly "farm labour"*** The item "activity status" was modified as 0904 "labour force status" in line with ILO (2013); item "time worked on the holding" as 0902 "working time on the holding"; "number of employees on the holding: time worked and sex" as 0903 "number and working time of employees on the holding by sex".
- ***Forestry:*** The item "presence of forest and other wooded land on the holding" was modified as 1301 "presence of woodland on the holding"; items "area of forest and other wooded land as primary/secondary land use" were modified as 1302 "area of woodland" in line with SEEA 2012; and item "main purpose of forest and other wooded land" as 1303 "purposes of woodland".

◆ Several items from the 2010 programme have been ***omitted*** from the 2020 programme; namely:

- ***Agricultural practices:*** item "use of good agricultural practices" was replaced by a breakdown of items on sustainable agricultural practices (see new items above).
- ***Demographic and social:*** item "whether holding is part of an agricultural household".
- ***Work on the holding:*** items "occupation of main job" and "time worked in main job".
- ***Intrahousehold distribution of managerial decisions and ownership*** (formerly "management of the holding"): items "identification of subholdings"; "identification of subholders"; "sex of subholder"; "age of subholder"; "area of crops managed for each crop group"; and "number of livestock managed for each livestock group". These items were replaced by an improved approach to assess the distribution of decisions and ownership within the household (see new items above).

- ***Household food security:*** food shortage subitems (a) "whether household members could not afford to eat what they normally eat at any time"; (b) "months in which food shortage occurred"; (c) "reasons for food shortage"; (d) "how the household's eating patterns were affected by food shortage"; and (e) "steps taken to alleviate food shortage", as well as items "whether the household fears a food shortage"; "frequency of normally eating selected food products"; and "height and weight". These items were replaced by an innovative approach developed by FAO's "Voices of the Hungry" (VoH) to appraise in a more straightforward way the severity of food insecurity as experienced by individuals in the population (see new items above).

1.27 ***Classifications***

- The land use classification has been updated to be consistent with the SEEA Central Framework adopted in 2012 by UNSC (see paragraphs 8.2.8 – 8.2.34).
- The areas of economic activity have been updated to be consistent with the International Standard Industrial Classification of all Economic Activities (ISIC) Rev. 4 (UN, 2008) (see paragraphs 8.1.21 – 8.1.23).
- The Indicative Crop Classification and Classification of Livestock have been updated to be consistent with the Central Product Classification (CPC) Version 2.1 (UN, 2015a) (see Annexes 4 and 6).
- The classification of machinery and equipment (see Annex 7) has been updated based on the Harmonized Commodity Description and Coding System (HS) Edition 2012.

CHAPTER 2

THE CENSUS OF AGRICULTURE IN THE 21st CENTURY: STATISTICAL POLICY AND DEVELOPMENT ISSUES

This chapter focuses on the new international development agenda (Post-2015 and Sustainable Development Goals, the Busan Action Plan for Statistics, the Global Strategy to Improve Agricultural and Rural Statistics) addressing the growing importance of data needed for measuring the impact of development policies and programmes as well as other emerging policy issues (environment and food security, increasing volatility of agricultural markets, etc.).

Introduction

2.1 WCA 2020 was developed at a crucial time for the international statistical agenda, in the context of the Post-2015 Development Agenda and the Busan Action Plan for Statistics. These highlight new and emerging needs for statistics, including the interaction between agriculture and the environment, known as Green Growth, food security and sustainable agricultural development, increased volatility in the agricultural markets, and the increasing call by the international community and national governments to measure the impacts of development policies and programmes. Structural data on agriculture remains crucial, with emerging needs pointing to data on climate change, environment, land and water use, as well as data on rural poverty.

2.2 In this context of an increased need for reliable and timely statistical data, concerns about the general decline in the overall quality and availability of agricultural statistics meant that this issue needed to be addressed in a comprehensive manner. The main stakeholders developed a "Global Strategy to Improve Agricultural and Rural Statistics" to provide a blueprint for a coordinated and long-term initiative to address the decline in national agricultural statistics systems and WCA 2020 is a critical component of this Global Strategy.

Post-2015 and the sustainable development goals

2.3 In the United Nations (UN) Millennium Declaration of 2000, governments around the world committed themselves to promoting sustainable economic growth, focusing on the poor and with human rights at the centre of the effort. To help track progress in meeting these commitments of the Declaration, a set of Millennium Development Goals (MDGs) was developed, comprising a framework of 8 goals, 18 targets and 48 indicators to be used to assess progress between 1990 and 2015. While the census of agriculture was not considered a primary data source for monitoring the MDGs, it had the potential to provide valuable data, particularly in the absence of other data sources, in support of the monitoring of 5 of the 8 goals.

2.4 As a follow-up to the Millennium Declaration, a Post-2015 Sustainable Development Agenda has been developed under UN auspices with a specific set of goals and targets. Some 17 goals are proposed, each with its own set of targets and indicators. The work of FAO supports many of the goals, in particular Goal 2 –"end hunger, achieve food security and improved nutrition, and promote sustainable agriculture". A set of targets and indicators for priority themes in the Post-2015 Sustainable Development Agenda has been developed in areas in which FAO has unique expertise and abundant experience as the leading specialized UN agency committed to food security and sustainable development. These areas include: ending hunger, food insecurity, malnutrition and rural poverty; better managing natural resources; and ensuring more sustainable ecological processes for a healthier environment for all.

2.5 The indicators to monitor progress towards these targets by the international community come from a variety of sources including FAOSTAT, FAO assessments, surveys and reports. As with the MDGs, the census of agriculture is not considered to be a primary data source for monitoring the Sustainable Development Goals (SDGs) but again has the potential to provide valuable data, particularly in the absence of other data sources. The census of agriculture underpins the statistical system which monitors the SDGs, providing the sampling frame for the agricultural survey programme and a benchmark for the national agricultural statistics system.

The Busan action plan for statistics

2.6 The demand for improved statistics to monitor the MDGs and the parallel effort to support a culture of results-based management has stimulated a decade-long effort to improve statistics. The results have been impressive, but much work remains to be done.

2.7 Based on this ongoing need, the Busan Action Plan for Statistics was adopted in 2011. The Busan Action Plan draws on the experience gained since the launch of the 2004 Marrakech Action Plan for Statistics (MAPS). Focusing on country capacity development through country-owned and country-led development strategies, it recognizes the interdependence of national and international statistical activity. It proposes a manageable number of actions that can be adapted in a flexible manner to meet country circumstances and encourages a coordinated, system-wide approach to capacity development. Like MAPS, it recognizes the complementary roles of developing countries, bilateral development partners and international agencies and encourages a coordinated, system-wide approach to capacity development aligned with countries' statistical development strategies. It stresses that improvements in country statistical systems will improve international statistics, while a more effective international system will provide more consistent advice and better support for national activities.

2.8 Providing the direction for the decade ahead, it supports three principal objectives:

- Fully integrate statistics in decision-making through improvements in statistical production process, relevance, quality and effective use by policy-makers;
- Promote open access to statistics by providing timely and reliable statistical data which increases government effectiveness and public confidence;
- Increase resources for statistical systems through coordinated donor assistance strategies consistent with countries' national priorities. Financial support to national statistical systems should be integrated in development assistance programmes, with developing countries providing in-country leadership.

2.9 In adopting a system-wide approach to capacity development to integrate national statistical activities within the requirements of planning, budgeting, monitoring and results, the implementation of the Busan Action Plan will help fill statistical gaps of relevance to critical policy issues. In this light, it recognizes the important synergies between survey and census data, administrative data and vital statistics and it explicitly supports greater transparency and encourages the use of new methods and technologies to increase the reliability and accessibility of official statistics.

2.10 WCA 2020 reflects these priority areas by emphasizing the need for a national integrated census and survey programme prepared in close consultation with users, thus improving its relevance and the effective use of statistical data by policy-makers. It promotes the use of new technologies as a way to improve the timeliness, quality and accessibility of statistics.

Global strategy to improve agricultural and rural statistics

2.11 An evaluation of FAO in 2008 argued that the most pressing need in national statistical systems was to improve the capacity for agricultural statistics. The decline in the priority level and in the resources (including financial resources to collect data) faced by national agricultural systems assigned to collecting and reporting reliable agricultural statistics was paralleled by a decline in donor support to such statistical activities. A number of reasons contributed to this decline. One reason was the lack of country-level capacity

in public statistical agencies, while a second was that many countries had failed to adequately include agricultural statistics in the National Strategies for the Development of Statistics (NSDS). Several international partners, including FAO, concluded that a global approach was needed to improve agricultural statistics and a "Global Strategy to Improve Agricultural and Rural Statistics" (2010) was developed in close consultation with national stakeholders. This Global Strategy was endorsed by the UNSC in 2010. As the first step in the implementation of this Global Strategy, an Action Plan was developed by the FAO in 2012, which is being implemented in cooperation with development partners.

2.12 Policy-makers at the national and international level and those developing investment strategies to enhance economic development face many challenges, given the changing circumstances of agriculture in the 21st century. While agriculture is the primary source to feed, clothe and provide materials for fuel and housing for a growing world population, the challenge is also to lift millions of people out of poverty and hunger, reduce the impact of agriculture on the environment and global warming, and sustain water and land resources. These are issues that go beyond national boundaries. The purpose of the Global Strategy is to provide the vision for national and international statistical systems to produce the basic data and information to guide the decision-making required for the 21st century. The Global Strategy is based on a thorough country assessment of data user needs.

2.13 The Global Strategy is based on three pillars:

Pillar 1: Identifying a minimum set of core data and determining national priorities.

2.14 The Global Strategy proposes a minimum set of 58 core items in three domains – economic, social and environmental – which each country should produce on a regular basis. A core item is defined as one whose data enter into a multitude of indicators needed to monitor and evaluate development policies, including sustainable agriculture and food security policies. With the development of the Post-2015 Sustainable Development Agenda, the minimum set of core data has been aligned accordingly, for monitoring progress toward meeting the Sustainable Development Goals (SDGs). This minimum set of core data will provide national and international policy-makers with necessary information that goes across national boundaries. While the agricultural census is not the primary source for the minimum set of core data, it can contribute to many of them and is specifically important for countries without an established and well-functioning annual survey programme. In the absence of an annual survey programme, the WCA 2020 recommended items can provide about a third of the Global Strategy's minimum set of core data in the year of the census. In addition, the census can provide a frame for specialized surveys for more than half of the minimum set of core data .

Pillar 2: Integration of agricultural and rural statistics into the national statistical system.

2.15 The Global Strategy provides the framework for integration of the agricultural statistical system into the preparation of the NSDS, putting an emphasis on the census of agriculture as a main pillar of the national programmes. Countries are encouraged to design a Strategic Plan for the Development of Agricultural and Rural Statistics (SPARS) mainstreamed into the NSDS process. The development of a master sampling frame (MSF) for agriculture is viewed as an essential element of this integration, highlighting the census of agriculture as one of the main data sources for building the MSF. One of the important methodological developments under the Global Strategy is the elaboration of an Agriculture Integrated Survey (AGRIS) methodology and toolkit for cost-effective approaches for collection of relevant agricultural and rural data on a regular basis (see paragraphs 4.15-4.16). This will assist countries with underdeveloped agricultural census and surveys programmes to move towards a fully integrated approach. In an integrated census and surveys programme the census of agriculture is broadly used for benchmarking for the subsequent agricultural statistics surveys and is a main reference for reconciliation of data from different surveys and sources.

2.16 In the same vein, the WCA 2020 argues forcefully for the development of an Integrated Statistical System, which can resolve many problems by avoiding duplications of effort, preventing the release of conflicting statistics, and ensuring the best use of resources. The modular approach discussed in this programme as one of the methodological approaches to the census serves as a transition towards a fully operational integrated agricultural statistics system for countries with underdeveloped agricultural surveys and census programmes. The programme advocates for linking the population and housing census with the agriculture census and stresses the importance of developing an MSF to be used for all censuses and surveys.

Pillar 3: Sustainability of agriculture statistics through governance and statistical capacity building.

2.17 The third pillar of the Global Strategy is to establish governance and capacity that are the foundations of sustainable national statistical systems. Policy-makers and others users of data are more likely to support a system that provides reliable data relevant to their needs. Understanding these needs for statistical information at the national level and what is required to supply that information is, therefore, a key element of the sustainability of an agricultural statistics system. The integration of agriculture into the national statistical system will require countries to develop an adequate governance structure and to build statistical capacity across the different institutions concerned. From this point of view, comprehensive capacity building activities carried out during the census implementation can contribute strongly to the overall goal of building/strengthening capacity in the domain of agricultural statistics.

CHAPTER 3
IMPORTANCE OF THE CENSUS OF AGRICULTURE

This chapter discusses the importance of the census of agriculture for both stakeholders and data producers in a country. First, 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 for agricultural planning and policy, as well as business decisions, and examples are provided. Uses of the census data for measuring environmental impact and work in agriculture, and for analysing food security, and gender issues are also examined. Then, the uses of agricultural census data as frames for agricultural surveys and as benchmarks for improving current agricultural statistics are highlighted.

Introduction

3.1 The census of agriculture is the principal means of collecting basic agricultural statistics in a country as part of an integrated programme of data collection and compilation aimed at providing a comprehensive source of statistical information for agricultural policy purposes, as well as for research, business and other uses, in addition to the usual statistical uses.

3.2 The census of agriculture provides a snapshot of agriculture in a country and an opportunity to identify trends or structural breaks in the sector as well as possible areas of intervention. Census data are used as a basis or benchmark for current statistics but the value of these data is increased when the results are combined with the results of other investigations and used for planning and policy purposes, including areas of investment and informed business decisions. Often, stakeholders see the need for more in-depth studies of specific domains of the agriculture sector and rely on the census as the frame for focused sample surveys.

3.3 The importance of the census of agriculture in satisfying the needs of both stakeholders and data producers is discussed here.

Stakeholders' needs

Agricultural planning and policy-making

3.4 The agricultural planning and policy-making process is an evidence-based process and heavily dependent on the statistical system. The agriculture census contributes to this process in a number of key areas, including food security and gender issues which are discussed later in this chapter. Other examples of planning and policy issues for which the agricultural census can contribute directly to this evidence-based process are:

- Promoting agricultural production and investments, to stimulate economic growth – census data on land tenure, labour inputs, area of unutilized land suitable for agricultural production, average area of crops by holding, average number of livestock by holding, access to credit, use of machinery and equipment are all relevant.
- Rural development – agriculture census data at low administrative levels and/or by agro-ecological zones on number of holdings, land tenure, holder's age and sex, holder's education, average agricultural area of the holding, average number of livestock by type, type of farm labour inputs, on use of machinery and equipment, and community level data are commonly used for the preparation of rural development programmes and specifically for supporting the market orientation of the agricultural producers and programmes for infrastructure development.

- Access to land and land distribution – the agricultural census collects various items needed for analyses on how agricultural holders get access to land and on the structure or distribution of the agricultural land in a country. For those analyses the census information about size of holdings, land use and land tenure types is paramount. Analyses could be made from different perspectives – e.g. age and sex of agricultural holders, main purpose of production, legal status of the holder, land use types, crops grown, average total and agricultural area of the holding, agricultural practices used in the holding. This information enables formulation and monitoring of policy measures and programmes addressing the needs of specific target groups – young farmers, subsistence producers, land consolidation measures, etc.
- Type of farming system – the agriculture census is the main data source for classifying holdings by type of farming system. For example, holdings can be grouped based on whether they are subsistence- or market-oriented, family or corporate, crop production- oriented, livestock production-oriented or mixed. The essential items recommended in WCA 2020 are an important source of data for the groupings needed. Different policies and programmes can be developed for targeted groups.
- Family farms - the analysis of characteristics and importance of family agriculture developed mainly at household level is greatly facilitated with the data provided by the census of agriculture, using data on total area of holding, size of the household and type of farm labour inputs.
- Crop diversification – the agriculture census provides information on types and area of crops cultivated by region, thus helping to promote diversification and the cultivation of new crops.
- Support schemes – the agriculture census provides data for a better understanding of the agricultural inputs used and their geographical distribution. The combination of this information with other economic data is used for subsidy schemes established for economic support, thus helping to achieve better equity between agriculture and other economic sectors.

Research, investment and business decisions

3.5 In addition to serving specific governmental policy purposes, the agriculture census provides indispensable data for the research and appraisal of the composition, distribution and past and prospective growth of the agricultural sector. Changes in cropping patterns, the emergence of new agricultural activities, geographical distribution of the agricultural population, changes in the sex and age structure of holders, availability of labour and trends in the agricultural labour force are examples of relevant issues for research and assistance in solving practical problems of industrial and commercial growth and management. In-depth agricultural research can be used to support evidence-based planning and policy-making, through the use of specialized statistical methods. By using these methods, it is possible to quantify the relationships among various characteristics, to better understand the reasons why farmers make certain decisions, and their likely response to particular policy actions. Agricultural censuses are often the only source of data for such analysis due to the availability of individual holding data. Research could facilitate the identification of business opportunities. Census data could, for example, help to identify comparative advantages of certain crops or livestock for export purposes and suggest the need for government or private investments to promote export-oriented production.

3.6 An agricultural census is also a valuable source of data for the private sector and the agricultural industry. 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 the area of specific crops in each district to help identify suitable sites for processing plants. An input supplier could use census data on input use 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.

Agriculture and the environment

3.7 Agriculture has an impact on the environment but on the other hand, it is also a source of environmental services. As the Global Strategy to Improve Agricultural and Rural Statistics points out: "The establishment of policies and programmes for mitigating the environmental impacts or to capitalize [on agriculture's]

potential as a source of environmental services requires extensive information." Agricultural censuses are sources of structural information that, through comparison at different points of time, contribute to the monitoring of environmental changes. In addition, data on the use of environmentally friendly practices and inputs, collected through the census of agriculture, helps decision- makers and planners when adopting measures to mitigate adverse effects.

3.8 Environmental impacts of agricultural practices such as methods of ploughing, crop rotation or sources of high GHG emissions can be analysed, thus helping countries to improve their ability to plan effective climate change responses and access international funding (see Chapter 8, Theme 6 "Agricultural practices" and Theme 15 "Environment/Greenhouse gas emissions").

3.9 Information on land use from the census of agriculture is crucial to analyse agriculture sustainability and productivity. The use of land can also have environmental consequences that range from pollution of waterways to global warming and the census of agriculture is the main source of data on the actual land use in a country.

3.10 The Kyoto Protocol, entered into force in 2005, operationalized the objective of the United Nations Framework Convention on Climate Change (UNFCCC) to stabilize greenhouse gas concentrations in the atmosphere "at a level that would prevent dangerous anthropogenic interference with the climate system" (Art. 2). Under this framework, participating states should regularly report their GHG emissions from all sectors, including agriculture. Countries can use data on land use, land use change, and forestry (LULUCF) (sink activities) to monitor the achievement of their targets. Countries are being asked to report their emissions at two-year intervals. These new requirements translate directly into the need for significant increases in capacity development to improve the data collection and analysis related to climate change. In response to this new need, the WCA 2020 introduces the possibility for countries to establish the baseline for such reports and can provide frame information for designing and conducting periodic sample surveys to collect data necessary for estimation of GHG emissions from the agricultural sector and calculation of other agro-environmental indicators.

3.11 Another important use of census information to measure environmental impact is with reference to water management and irrigation. Methods of irrigation, sources of water and final disposal of water used for irrigation are important elements to analyse threats and actual risks to the environment. The theme on irrigation included in this programme is also useful for this analysis.

Food security

3.12 Assessing food security by means of the census of agriculture is challenging. For this reason, WCA 2020 introduces an innovative approach in its census supplementary theme on food security to access valid information on the severity of food insecurity as experienced by individuals in the population. The approach, developed by FAO and known as the Food Insecurity Experience Scale (FIES), aims to measure household food security through experience-based food insecurity. This is based on the premise that the severity of the food insecurity situation of an individual or a household can be inferred from observing typical behaviours and experiences associated with food insecurity. These include, for example, the condition of being worried about not being able to procure food, having to compromise on the variety and quality of foods consumed, and being forced to cut portions or to skip meals.

3.13 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 on 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.

3.14 The collection of community-level data (see Chapter 9) can also 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.

3.15 Issues related to stability of food supplies, such as weather conditions and exposure to natural disasters, can also be studied through the food security theme as well as the community component of the agricultural census.

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

Work in agriculture

3.17 The agricultural census is essential to obtain relevant data on work inputs and main work activities, as well as on the labour force in the agriculture sector, broken down by different characteristics (see Theme 9). Unlike conventional labour force surveys that provide work data using a short reference period (usually one week), the agricultural census uses a long reference period (usually one year) in order to better capture the seasonal character of the agricultural activities. From this point of view, the agricultural census data complement the work data collected in some household-based surveys (labour force surveys, income and expenditure surveys, Living Standard Measurement Surveys) carried out by countries on a regular or ad hoc basis. In the absence of such surveys, the agricultural census fills important gaps in the national statistics on work.

3.18 The agricultural census constitutes an important data source to evaluate levels of participation and time worked on agricultural holdings, including those which produce agricultural goods mainly for own final use. The latter are especially relevant and important for developing countries. The collection of data on the main activity, time worked, status in employment and labour force status for each household member, in conjunction with demographic and social characteristics, gives additional value to census data collection, enabling comprehensive analysis of work data that takes into account gender, education, etc.

3.19 Census data on status in employment of main job and on forms of payment by selected characteristics, such as types of agricultural holdings or main purpose of production of the holding, are a valuable source of data to support labour and other social policies related to the quality of employment, as well as for macroeconomic purposes. To shed light on the integration of household members working on the holding into the labour market, the census provides valuable information on their labour force status.

3.20 The use of an annual reference period in census data collection is especially important for national accounts estimates and to assess the relationship of work statistics with other economic and social statistics that also use a long reference period, such as statistics on household income, poverty, social exclusion and education.

3.21 The concepts and definitions for work statistics applied in the WCA 2020 are in line with the Resolution concerning statistics of work, employment and labour underutilization (ILO, 2013) adopted by the 19th International Conference of Labour Statisticians (ICLS) in 2013.

The role of gender in agriculture

3.22 It is globally acknowledged that the need for promotion of gender equality and empowerment of women are 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.

3.23 The contribution of women to agricultural development is often not well understood because of the lack of data and the challenges 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 among 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).

3.24 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. Theme 10 "Intrahousehold distribution of managerial decisions and ownership on the holding", is used to better reflect gender-based differences in decision-making and ownership of key agricultural assets, such as land and livestock. Such understanding should lead to better-targeted policies and programmes.

3.25 Data on work inputs and employment characteristics collected in Theme 9 for each household member can be used to study the responsibilities of women for work on and off the holding.

Baseline data for monitoring and evaluation

3.26 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.

3.27 Agricultural census data can be tabulated for any defined geographic area or for any particular group of holdings, which means that data can be provided for specific target groups, such as for a particular 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.

Contribution of agriculture in national accounts

3.28 The census of agriculture does not provide current statistics on production, except for the census reference year; nevertheless, it has an important role in compiling national accounts. It refers basically to the following aspects:

- It gives information to define the structural components of the national accounts and for the economic accounts in agriculture. Data about infrastructure and investment in agriculture give parameters for estimating the gross capital formation account. Data on agricultural employment contribute to the measurement of the value added for agriculture in total gross domestic product (GDP). Land use data, along with data on livestock, area under various crops and aquaculture allow adjustments in production data.
- Census information is one of the main inputs for developing the SEEA (SEEA, 2012; UN, et al., 2014).
- Proper coordination between the census of agriculture and the economic census allows the establishment of the base year for national accounts. It is one of the important inputs for developing the input-output matrix and for compilation of the supply-use sheets.
- In some countries the agriculture census may be the only source of information on the contribution of subsistence agriculture to the national accounts and the estimation of the non-observed economy in the agricultural sector.

Statistical needs

Advantages of data from the agricultural census

3.29 The range of needs for statistics to support agricultural planning and policy-making is very broad. The primary need is 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.

3.30 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 have been examined in this chapter.

3.31 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 field 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 and standard statistical concepts and procedures. Furthermore, measurement errors cannot be easily quantified. In these circumstances, a census of agriculture can be invaluable for providing a statistically sound source of agricultural statistics.

3.32 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 planted areas classified by type of land tenure or use of irrigation. 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.

Benchmark and reconciliation of agricultural statistics

3.33 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 a reliable benchmark for improving current crop and livestock statistics.

3.34 For crops, the agricultural census usually provides the most reliable data available on the area of each crop at each administrative level for the census reference year. This is especially the case for minor crops, for which 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. Census data can provide benchmark figures for current statistics on permanent crops, especially for trees not grown in plantations. Data on the number of productive and non-productive trees can be used to project future production trends.

3.35 Current livestock 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.

3.36 Often, countries find it difficult to reconcile the current agricultural statistics obtained from sample surveys or administrative collections with crop or livestock data from the agricultural census. Sometimes, there are good methodological reasons for differences in the statistics. The geographic area covered by either collection may be incomplete – for example, when urban areas are 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. Subnational 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.

3.37 In the end, discrepancies between data from the agricultural census and the current statistics may come down to differences in the data collection methodologies and the quality of data associated with each data source. This especially applies in places 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.

Frames for agriculture surveys

3.38 One of the important aims of the census of agriculture is to provide sampling frames. A sampling frame is a list of units to be sampled. The census can serve this purpose in two ways:

- Providing frames for each of the surveys in the agricultural survey programme;
- Providing information for building the Master Sampling Frame.

3.39 Most common sampling frames in agricultural surveys are constituted by lists of holdings (which can be household-based) and lists of areas of land, such as the enumeration areas (EAs) or other materials, such as maps or satellite images. They should include auxiliary information, such as area of holding, number of livestock, type of land tenure, etc., in order to improve the sampling design. Auxiliary information is paramount for stratification; target populations for the agricultural surveys are determined by applying stratification criteria to the agricultural census frame. In addition, the census by complete enumeration provides the frame for rare crops or livestock types.

3.40 Existing sampling frames need to be updated and censuses like the population and the agricultural census are crucial in bringing them up to date at the point in time of the agricultural census.

3.41 The Global Strategy to Improve Agricultural and Rural Statistics[1] advocates for the building of an MSF, which is a general purpose sampling frame created from a population and housing census and/or an agricultural 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.

3.42 An MSF should be maintained and used for long periods for agricultural surveys, household surveys in rural areas, specific surveys in some regions of a country, etc. An MSF is basically a list of area units covering the entire country. These area units can include administrative units such as regions, counties, villages, or EAs defined ad hoc for the agricultural census or the EAs used for the population and housing census. EAs must cover the whole in-scope national territory. The census of agriculture, in particular, provides auxiliary information on the agricultural and rural attributes of the household. Therefore, at the very beginning stages in the planning of the agricultural census, a careful analysis should be conducted regarding how to define the EAs, their compatibility with the population and housing census EAs, their size and expected number of holdings and clear rules for their identification (including the establishment of coordinates by means of the global positioning system, or GPS).

The statistical farm register

3.43 The directory of holdings and holders obtained as a result of an agricultural census using complete enumeration constitutes an excellent first step for establishing a statistical farm register. Regularly updated statistical farm registers are usually used as sampling frames for agricultural surveys. They could also constitute the basis for agricultural censuses if the censuses are based on registers in the future.

3.44 Special consideration must be given to preserving data confidentiality. Statistical data are confidential by law, while data from other sources are not. Data in the statistical farm register must be considered

1 *Global Strategy to Improve Agricultural and Rural Statistics*, Report #56719 GLB. World Bank, FAO, United Nations. September, 2010.

statistical data because they were obtained from the agricultural census; therefore, special measures must be taken to assure confidentiality.

3.45 Maintenance and updating of statistical farm registers is a major concern because they easily become obsolete. The updating process must take into consideration births and deaths, changes due to subdivision of an existing holding or newly developed agricultural land, land abandonment, urban development, etc., and must also take into account frequent changes of holders (if holders sell or rent out land, totally or partially, or the holder dies and the property is divided among the heirs).

3.46 Statistical farm registers usually contain information about the name and address of holder and holding, sex of holder, total area of holding, main land uses and types of animals kept. Therefore, the updating process should foresee a regular update of all this information provided by the census. Several administrative and statistical sources must converge to maintain the farm register, including tax records, cadastral records, directories from farmers' associations, population census records, economic census information, regular agriculture production surveys, etc., and each source has a special identification key. Ideally all sources could use the same identification key, but in practice it is necessary to establish a link between the identification keys of the different sources used. From the early stages of census preparation a decision about the establishment of a statistical farm register from the census must be taken, together with the updating procedure. If the census will serve for that purpose, the identification keys of the sources used must be requested in the census forms (cadastral register number of the parcels, tax codes, etc.).

CHAPTER 4
METHODOLOGICAL CONSIDERATIONS

This chapter discusses the key methodological issues to be considered in planning and development of the census of agriculture. The approach to be used – whether to undertake a "classical" census or a "modular" census – is a key decision with implications for the integrated census and survey programme. Existing sources of data should be fully evaluated before deciding what to collect in the census questionnaire. Registers, other administrative records and statistical sources can all provide valuable data. A good frame is critical to the success of the census. The frame can be compiled from existing sources or from a special listing exercise. The best solution is often a combination of frames using common concepts. Sampling in the census provides a cost-effective solution, particularly if a modular census is to be undertaken. The loss of detailed information at subnational levels, and particularly for the smallest administrative units, has to be carefully considered when deciding on the sample design. The quality of the data is an important issue and a quality assurance plan should be prepared and implemented. New developments in data collection methods, including the use of technology, should be considered in planning the census. These methodological issues and other operational aspects of the census are covered in more detail in Volume 2.

Introduction

4.1 In response to increasing demands for data, WCA 2010 increased the number of items to be considered as part of the census programme. At the same time, FAO recognized that including too many items in a single statistical enquiry would be counterproductive and so the concept of the modular approach was introduced. It was also recognized that many of the items in the supplementary modules could not be considered "structural", in the sense of not changing rapidly over time, and it could be argued that they were better suited to the statistical survey programme.

4.2 When deciding whether to include non-structural items in the census, and whether to adopt the modular approach, consideration should be given to the national statistics survey programme to see whether the survey programme provides a better "vehicle" with which to collect the required information. Countries with a well-established agricultural survey programme, along the lines promoted by the Global Strategy, will conclude that many of the non-structural items are best collected through this survey programme (see Chapter 2). Where non-structural items are better collected using a household frame, these are included in the household survey programme; data on households that are not agricultural producers may already be available from other sources, such as the population and housing census. Although linking data from two different sources is never easy, it can be done, and with careful planning of the national census and survey programme, and the use of unique household and/or personal identifiers, data sets can be successfully linked.

4.3 The WCA 2020 retains the idea that a wide range of items can be covered, while acknowledging that the census of agriculture can be conducted in many different ways. For the purposes of this publication, four modalities are discussed, including the two basic methodological approaches, namely the "classical" approach and the "modular" approach which was introduced in the WCA 2010. The distinguishing features are in the design of these four modalities and not in whether complete or sample enumeration is used. An overview of the four modalities for conducting the census is provided in the following sections and will be further elaborated in Volume 2.

The classical approach

4.4 The classical approach may be considered a census conducted as a single one-off operation in which all the census information is recorded. By extension, this classical approach also includes the short-long questionnaire concept, even though the long questionnaire may be completed at a second visit. In this approach, the short questionnaire is administered to screen the target population, while the long questionnaire is administered only to holdings identified as being above the established threshold or to a sample of such holdings. The short questionnaire collects basic information on all households and identifies holdings by using the cut-offs. The long questionnaire collects more detailed information from the holdings.

4.5 The classical approach should include all "essential" items (see paragraphs 7.9 – 7.10) and may include "additional" items (see paragraph 7.5) depending on the country's requirements, other data sources – particularly for non-structural items – and resources. This approach is appropriate for countries having an integrated census and survey programme or wishing to collect some additional items at low administrative levels.

The modular approach

4.6 The modular approach has a clearly distinguishable core module and supplementary module(s), using information collected in the core module as the frame for the supplementary module(s). A core module with only one supplementary module, the combination of which covers all "essential" items, is considered to be the short-long questionnaire concept and thus a classical approach.

4.7 In the modular approach, the core module includes frame items as well as any other items on the census list of items, or even outside this list. These other items are considered necessary to establish the frame for the supplementary module(s) or to provide data at the lowest level. If the frame to be established uses cut-off limits, the identification of these thresholds also needs to be built into the core module.

4.8 The supplementary modules use the frame generated by the core module to target specific populations, which can be all holdings, all holdings above a certain size or subsets of agricultural holdings, such as livestock producers or crop producers – again, with or without size considerations. Supplementary modules are used to collect a more extensive range of data compared with the classical approach. Modules can be thematic in nature where the population is a subset of holdings, or include multiple themes where the target population is the same for a group of themes. Modules can be conducted simultaneously or over a period of time. Between the core and the supplementary modules, all essential items should be included. Since the number and the extent of the supplementary modules are not fixed, the modular approach allows for collecting a wide range of additional items depending on the needs of the country and the resources available.

Use of registers and administrative records as a source of census data

4.9 Registers and other administrative sources can be used as a source of census data, depending on their content and quality. In principle, when greater amounts of information can be obtained from administrative sources, the production of census-type statistics will be faster, cheaper and more complete. The most complete use of registers will be when all the essential census items can be based on administrative sources.

4.10 In cases for which registers cannot provide all the essential items, a combined approach that uses administrative and statistical sources is an option. Essentially, the combined methodology makes use of registers relevant to the census, complemented by administrative records and survey/census data. The use of survey/census data is intended to:

- Provide information for census variables that cannot be based reliably on administrative data;
- Check, update and improve the quality of census data derived from administrative sources;
- Provide a linking mechanism in order to bring together different sources; and
- Evaluate the quality of the administrative data sources.

4.11 The register-based census combined with full enumeration/surveys offers several advantages:

- It can be much cheaper than a classical census, with a full enumeration collecting all census items from the whole population;
- It can reduce the burden on enumerators and respondents;
- It can reduce the non-response rate in cases where information is driven from registers; and
- It should be possible to correct the survey data for differing levels of non-response in different population groups.

4.12 Regardless of the census methodology adopted, it is extremely important that a unique primary key variable is used in all the data sources. The use of a unique identifier is essential in order to link information successfully. Unique identifiers also assist in the detection (and correction as necessary) of identical statistical units (duplicates).

The integrated census and survey programme

4.13 The census of agriculture is not a substitute for a regular agricultural survey programme. The modular approach may be useful for countries where the agricultural census and survey programme is not well-developed and the conduct of modules over a period of time can lay the foundation for an integrated agricultural census and survey programme. Since WCA 2010, emphasis has been given to developing the agricultural census within the overall framework of the system of integrated agricultural censuses and surveys. A new integrated census/survey modality of conducting the census of agriculture is introduced in this programme and aims to re-enforce the integration of the census of agriculture in a multi-year census/survey programme using the Agricultural Integrated Survey (AGRIS) concept.

4.14 AGRIS is a modular survey programme which is to be articulated with the agricultural census programme and conducted on an annual basis between two censuses. It consists of one core module and four rotating modules: "economy", "labour force", "machinery and equipment", and "production methods and environment". Additional modules can be added as needed. In the integrated census and survey modality, AGRIS is synchronized with the agricultural census and operated over a ten-year cycle.

4.15 This integrated census/survey modality (census and AGRIS) will start with a light census covering the core module defined in the modular approach and possibly the core module of AGRIS (on a sample basis) in countries where this is particularly relevant and feasible. As defined in paragraph 4.7, the core module in the modular approach includes frame items as well as any other items on the census list of items, or even outside this list. The AGRIS core module covers crop production and livestock production. Between two censuses, the AGRIS core module and one or more of the rotating modules will be implemented each year. In this integrated census/survey modality, the light census together with the AGRIS rotating modules should cover all essential items. The implementation frequency of the modules will depend on the countries' agricultural statistics systems and data demand priorities.

4.16 The integrated census/AGRIS is designed as a cost-effective way of producing a wide range of data on various dimensions of agricultural holdings. It proposes to decrease the burden of conducting censuses by scheduling the collection of thematic data over a ten-year time frame. This will contribute to a more regular flow of data, which would be more in line with the limited capacities currently in place for the production and use of statistics in many countries. It should also facilitate the funding of the census/survey programme by spreading the total cost over ten years.

Main types of frames for the census of agriculture

4.17 There are two main types of frames for collecting agricultural statistics, the list frame and the area frame. The list frame comprises a list of agricultural holdings whereas the area frame comprises segments of land. In some cases a multiple frame approach is used, in which part of the population is covered by a list frame (e.g. commercial holdings) and the remainder (e.g. other holdings) by an area frame (FAO, 1996b; FAO, 1996c). For the census of agriculture, the list frame is the most common frame and this is described below.

4.18 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, the agricultural holdings. An ideal frame would be a list of all agricultural holdings, based on the operational definition of the agricultural holding adopted by the country, identifying each unit without omission or duplication and without including any units other than agricultural holdings. Such a list could be obtained through a population and housing census for the household sector, a farm register, a listing exercise or other sources. The frame for the non-household sector can also come from the farm register, administrative records or other data sources.

4.19 Where a farm register exists, it can be a good frame for an agricultural census, provided: (a) it includes all agricultural holdings according to the definition established; and (b) it is regularly updated, to remove units that cease to operate as holdings and to add new holdings. Along with the usual identification criteria, a farm register usually contains some basic information about each unit, such as land area, types of livestock kept, types of crops grown, etc. – information which is updated periodically and can be useful for stratification where sampling techniques are used. 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. In other cases, they are established by law as part of the administrative process and updated annually.

4.20 For the non-household sector, 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 non-household agricultural units in their areas of responsibility.

4.21 One issue with frames based on farm registers is that they are often established for administrative purposes and may not be compatible with statistical needs. The unit on the register often does not correspond with the definition of the agricultural holding for the agricultural census. For example, the register may be based on cadastral or other land records in which each parcel of land is identified, rather than the holding unit. Also, registers are usually based on land ownership, which is not always suitable for an agricultural census because several people in a household may manage land separately and ownership and management are not always synonymous. 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 it actually does.

4.22 Another type of frame for the household sector of an agricultural census is one created from the population and housing census as a one-time exercise, but which is not kept up to date or maintained as a farm register afterwards (see Chapter 5). The population and housing census would include additional questions on agriculture to identify households involved in "own-account agriculture" as a frame for the agricultural census. For such a frame to be useful, the agricultural census would need to be undertaken as soon as possible after the population and housing census to ensure that the list of households involved in "own-account agriculture" is current.

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

4.24 Even a list of all households from the population and housing census can provide a useful frame for an agricultural census, by using the following method: (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.

4.25 In all cases where the population and housing census is used to build the frame for agricultural holdings in the household sector, it is essential that the definition of the agricultural holding be kept in

mind. Where this is based on minimum size criteria such as land area, numbers of livestock, numbers of fruit trees, etc., these minimum size criteria need to be identified at some stage.

4.26 Where a frame of agricultural holdings, households with own-account agricultural production, or rural households is not available from an existing farm register or from the population and housing census, it is necessary to build a frame as a preparatory activity of the agricultural census. The country is divided into suitable geographical units, or 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 and housing censuses are usually conducted using EAs as the basic building block and it is often possible for the agricultural census to piggyback onto the population and housing census field system by using the same EAs and making use of maps and other field materials.

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

4.28 Care must be taken 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.

Sampling for the census of agriculture

4.29 Agricultural censuses are conducted using different approaches adapted to resource constraints and national conditions. In order to increase efficiency in the use of resources, some countries carry out their agricultural censuses using a sample enumeration. Sample enumeration consists of sampling the whole or part of the target population. The target population is usually the total of agricultural holdings in the country. In such cases, the quality of the frame from which the sample is taken is absolutely crucial.

4.30 The main advantage of sample enumeration is the reduction in costs derived from the reduction in field work. To enumerate only a sample of holdings implies fewer field personnel (enumerators and supervisors), fewer training venues and trainers, fewer forms and questionnaires to deliver and collect, and less information to check and process. This is also important when some parts of the country with difficult access contribute only a small proportion to agriculture and sample enumeration can give a good picture of the situation there.

4.31 Some of the weaknesses of a sample enumeration are:

- The amount of subnational and other finely classified data that can be produced is limited. Usually, sample sizes should be large enough to retain many of the attributes of a complete enumeration census providing data at the subnational level, even if finer level data, such as for villages, cannot be provided;
- Cross-tabulations that were not planned at the stage of sampling design may not be possible or may have high sampling errors;
- In the case of rare events, such as areas of minor crops or the number of rare types of livestock, few of these events would be picked in the sample and therefore the data would be subject to high sampling errors;
- Its application requires personnel who are well trained in sampling methods and analysis, which is not always the situation in many developing countries; and
- It may not provide an adequate or complete frame for agricultural surveys.

4.32 Sample enumeration can be applied to the whole target population. In many situations, however, sample enumeration is combined with complete enumeration. Ways of combining sample and complete enumeration are:

- Use of complete enumeration in the most important agricultural regions of the country and a sample of villages or EAs for the rest of the country (where agriculture is less important). It must be noted that, in contrast to the modular approach, the sample enumeration here is used on a different population (holdings not covered by the complete enumeration);
- Use of complete enumeration for some types of holdings (e.g. commercial and/or large holdings, which may account for a significant part of agricultural production) and use of sample enumeration for the remaining holdings; and
- Use of complete enumeration for essential items where detailed geographic information is required (e.g. area of the holding) and sample enumeration for other items where more aggregated information is acceptable (e.g. items on parcels).

4.33 In these cases, combining sample and complete enumeration may increase efficiency and data quality, in comparison with a census conducted only on a sample enumeration basis. In some cases, countries find it expensive to use complete enumeration in areas or for types of holdings that offer a marginal contribution to agriculture. The disadvantage is that the sampled areas or holding types will not provide detailed information at the small administrative level, as well as no complete frame for ongoing sample surveys.

4.34 When deciding whether to use a sample enumeration, in addition to efficiency considerations (precision versus costs), other elements should be taken into account, such as: a) desired level of aggregation for census data; b) use of the census as a frame for ongoing sampling surveys; c) data content of the census; and d) capacity to deal with sampling methods and subsequent statistical analysis based on samples.

4.35 When using sample enumeration in census-taking, special attention should be devoted to the issue of collecting information on the smallest holdings. Usually very small holdings – urban or peri-urban households with kitchen gardens or backyard animals, or holdings below the thresholds established for the agricultural census (see Chapter 6) – make little contribution to total agricultural production and it might not be cost-effective to include them in a complete enumeration exercise. 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. It is also important to reflect women's participation in agriculture. It is important, therefore, not to ignore the smallest producers and to measure their contribution by conducting a sample enumeration of such holdings.

Quality assurance

4.36 The definition of quality is necessarily broad and covers relevance, accuracy, reliability, timeliness and punctuality, accessibility and clarity, comparability and coherence. It is important to have a quality assurance plan in place for the census to ensure confidence in the data and to help the users understand the quality issues associated with the data.

4.37 A Post Enumeration Survey (PES) is an essential component of the quality assurance framework and should be included in the census plan and budget.

Methods of enumeration

4.38 This section provides a brief description of some of the most frequently used methods of enumeration for the agriculture census. Advanced technologies, such as information technology, geographical information systems (GIS) and GPS have created new opportunities for data collection to increase efficiencies and improve the quality of data. For instance, the use of advanced technologies has the potential to lead to improvements in data quality, including timeliness, reduction of undercoverage and response error, and reductions in staffing and other cost efficiencies.

Interviewing methods

4.39 Face-to-face interviewing methods are still commonly practised in census taking. However, the traditional paper and pen approach is increasingly being replaced by the use of mobile devices and this trend is expected to continue.

4.40 ***Paper and Pen Interview (PAPI)*** - The PAPI is a traditional method in which enumerators interview the respondents and data is collected by the enumerators using paper questionnaires. The method is useful with respondents who need assistance to complete the questionnaires and requires little technical knowledge for implementation. However, the method requires complex logistics for other areas, such as preparation and printing of questionnaires, distribution, centralization and storage of materials, as well as hiring of data-entry operators and supervisors which are additional operational costs.

4.41 ***Methods using advanced technologies*** - Recent developments in new technologies, particularly information and communication technologies and geo-referencing devices, provide new opportunities to improve timeliness and also to reduce the potential for enumerator and data processing errors and to improve quality checks, thus improving the overall quality of data.

- ***Computer Assisted Personal Interview (CAPI)*** - In the CAPI method the enumerator conducts an interview with the respondent using an electronic questionnaire on a mobile device, such as a personal digital assistant, tablet, laptop or smartphone, which the enumerator uses to record the responses. The devices can also be pre-loaded with addresses or maps of the enumeration area for use during field work. The devices can also be programmed to provide real-time sample selection which can be particularly useful for countries adopting the modular approach. For the agriculture census, CAPI is often used with GPS, either directly through the device or by linking to external GPS devices. This allows the identification of the geographic coordinates for the holding or parcels and is used in some cases to measure areas. The CAPI method also allows for improvements to management of data collection from supervisors and from regional and central levels.
- ***Computer-Assisted Telephone Interview (CATI)*** - The CATI method collects data for the holdings by telephone, with the operator located at central level reading and completing the questionnaire on the computer. In some cases CATI may be used for certain populations of the census – for example, for commercial farms – while face-to-face or mail-out/mail-back methods would be used for the majority of holdings. CATI can also be used to follow up non-response from mail-out/mail-back or face-to-face enumeration. Another use is for quality checking with phone calls to verify the data. In many countries, CATI may not be feasible for data collection of the majority of holdings but could be used for follow-up or quality checking, particularly for certain populations such as commercial farms or government farms.

4.42 Other methods, such as self-interviewing methods require completion of the census questionnaires by respondents. This offers significant cost savings in that self-completion methods are cheaper than enumerator methods because there is a significant reduction in the field force. However, non-response is an issue which needs to be addressed, particularly for populations that are difficult to enumerate, and resources will need to be allocated for follow-up. In addition, self-interviewing systems require the establishment of additional services (usually by telephone) to handle queries from respondents.

- ***Computer-Assisted Self-Interviewing (CASI)*** - The CASI method collects data by means of questionnaires placed on the internet using secure methods and completed by a knowledgeable respondent. Each holding is usually assigned a special password or security code to access the questionnaire, which allows the statistical office to track responses and to ensure that the questionnaire for a given holding is submitted only once. As with CATI, the method may be useful for certain populations of the census, such as commercial farms.
- ***Mail-out/Mail-back and Drop-off/Pick-up*** - The mail-out/mail-back method is a self- enumeration method in which questionnaires are mailed to respondents, completed by respondents and mailed back. The method requires that special attention be paid to the design of the questionnaire to assure its suitability for self-enumeration and the formatting and design of the questionnaire will

differ from those used for interview-based methods. As the form is paper-based, data capture and processing are needed following the return of the questionnaire. Dedicated efforts for follow-up are usually required with this method. The method may be used for certain populations of the census, such as commercial farms or government farms.

- ***An alternative is drop-off /mail-back and drop-off /pick-up.*** In these cases the census form is dropped off at the respondent's address by an interviewer and it can be mailed back by the respondent or collected by the enumerator at a later date.

Complementary tools

4.43 ***Global Positioning Systems (GPS) and Geographical Information Systems (GIS)*** - GPS makes it possible to find the geographic position of a point on the earth's surface by longitude and latitude. Collection of GPS coordinates has several advantages for preparation of the census frame or a master sample frame. It can allow geo-referencing of the holding, the household and the land to the appropriate administrative areas. It can also allow linking to satellite imagery to establish area frames for agricultural surveys. GPS is suitable for face-to-face interview methods of enumeration. During enumeration, GPS- enabled devices, together with customized location software, can be used to assist enumerators to locate the route and holdings to be enumerated or to assist with census management.

4.44 Location data collected with GPS devices are useful both for census preparatory activities and during data collection. Location data can be used to assist with census cartography – for instance, location data on the holdings can be used to adjust enumeration areas. It can also be combined with GIS to monitor enumerators when the location of the holding is collected during enumeration. When data transmission from the field is timely, the location data can be used to provide near real-time monitoring by overlaying the locations covered over maps of enumeration areas and maps of holdings in the enumerator's workload.

4.45 GPS devices can provide objective measures of areas of the holding or, on a more limited basis, to provide verification of data from respondents, which would provide more accurate data. The GPS devices enable much more rapid measurement of areas than traditional objective methods for area measurement. The collection of objective measures is more time-consuming so they would be collected only from a subset of holdings. However, as with CAPI methods, consideration needs to be given to the cost and use of devices and to ensuring that enumerators have sufficient computer literacy and training to operate the devices.

4.46 GIS can also be useful for census management, as location data can be mapped as part of management of the enumerators. GIS also has benefits for analysis and dissemination of census data as covered in Chapter 10 "Tabulation, dissemination and archiving". It allows the incorporation of detailed geo-referenced data into census analysis.

4.47 ***Short Messages Service (SMS)*** - SMS may be used in various stages of the census project to share information with field personnel and respondents. The service may be used to send passwords, guidelines, alerts, marketing messages, reminders, etc. If the SMS gateway is integrated to the central database of the census, various alerts can be sent to the census management when various business- critical events and violations occur – for example when the monitoring system detects that "coverage is lower than expected".

CHAPTER 5
RELATIONSHIP TO OTHER CENSUSES

This chapter highlights relationships between the agriculture census and other data collections in an integrated statistical system. Approaches which can be used to enhance census data collection are discussed: firstly, using the population and housing census to collect agricultural data to meet some of this demand; secondly, methods for coordinating and linking to related censuses, specifically the aquaculture census; and thirdly, use of the agriculture census to collect additional data for households that are not agricultural producers, households living in rural areas or households whose members are working in an agricultural industry or engaged in small-scale fishing activities.

Introduction

5.1 In the WCA 2020, as in the previous programme, emphasis is given to coordinating the census of agriculture with other censuses. This chapter discusses the ways in which this can be done. However, it is not possible to give a unique set of recommendations to all countries as 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. Nevertheless, due importance should be given to the use of international standard concepts, definitions and classifications.

A. Collecting agriculture data in the population and housing census

5.2 The population and housing census is one of the most important statistical collections undertaken by a country. Normally, they are undertaken every ten years. In an integrated statistical system, the connection between the population and housing census and the agriculture census is strong, and as such it is useful to look at ways to strengthen the relationship between the two censuses.

5.3 The WCA 2010 advocated for a stronger linkage between the population and housing and agriculture censuses. This approach was implemented by several countries during the 2010 round of agriculture censuses. The practice is now more relevant than ever and has therefore been retained for the 2020 round. This section provides a summary of the approach; more detailed guidance on collecting agriculture data in the population and housing census, including suitable data items, can be found in the following publications: *World Programme for the Census of Agriculture 2010* (FAO, 2007); *Guidelines for Linking Population and Housing Censuses with Agricultural Censuses* (FAO and UNFPA, 2012); and *Principles and Recommendations for Population and Housing Censuses* (UN, 2015b).

Agriculture in the household sector

5.4 This approach is considered suitable for countries where households and agricultural holdings are closely related because most agricultural production activities are in the household sector, which is the case in many developing countries. Where the agriculture census is based on other approaches, such as area frame survey or administrative records, linking data or combining estimates post-enumeration may be more appropriate. At the operational level, linking the population and housing census with the agriculture census is more suitable for countries where both censuses are carried out as a household enquiry. This provides the opportunity for coordination between the two census activities in ways that can save costs for the national statistical system and enhance the usefulness of the agriculture census data. However, as the population census covers only households and not enterprises, integration of the agriculture census and the population

and housing census can only apply to agriculture holdings in the household sector. Agriculture holdings in the non-household sector will need to be addressed separately.

Statistical units in the agricultural and population censuses

5.5 The primary statistical unit for a population census is the household, whereas for an agricultural census it is the agricultural holding. The unit common to the two censuses is therefore the household engaged in own-account agricultural activities. Normally, there is only one agricultural holding in a household, and it is this one-to-one correspondence which allows integration of the two censuses.

5.6 There are instances in which there can be two or more holdings in a household or two or more households operating a holding but these are usually very rare. These cases can be dealt with in several ways in order to match the holdings to the households. In practice, countries decide on the most suitable approach in their context. For example, 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 6.2 to 6.14.

Integrating the agriculture census and the population and housing census

5.7 The relationship between the agriculture census and the population and housing census can take several forms, ranging from coordinating aspects of the two censuses to including key agricultural items in the population and housing census. Previously, existing data in the population and housing census has been used to attempt to identify households involved in own-account agricultural production. However, there are limitations to this approach; it may not cover all persons working in agriculture because of the seasonality of many agricultural activities and because agriculture may not be a person's main activity. The FAO and United Nations Population Fund (UNFPA) Guidelines (2012) provide guidance on basic items which can be included in a population and housing census to identify households engaged in own-account agricultural production. In a few specific cases the data collection for the two censuses has been carried out as a joint field operation, although this is generally feasible only for a few countries with extensive experience of integrating censuses.

5.8 The relationship between the two censuses can cover:

- Coordinating aspects of the two censuses in terms of:
  - use of common concepts, definitions and classifications
  - sharing field materials;
- Using the listing of the population census as a starting point for the frame for the household sector of the agricultural census;
- Collecting agriculture data as additional items in the population census, either as basic items or further supplementary modules.

5.9 Key uses for data collected from the population and housing census are: serving as a frame for the household sector of the agricultural census; improving sample design for surveys and censuses; and planning the agricultural census fieldwork – for example, providing information on the geographical distribution of households with own-account agricultural production, which can help in organizing enumerator workloads.

Additional items in the population and housing census for collecting agricultural data

5.10 For countries wishing to include additional agriculture-related items in the population and housing census, two topics are recommended, as indicated in Principle and Recommendations for Population and Housing Censuses: the 2020 Round (UN, 2015b). With the first topic, at the household level, information is collected to identify households engaged in own-account agricultural production. With the second topic, at the individual person level, information is collected to identify persons involved in agricultural activities during a long reference period, such as a year before the census.

5.11 The first topic is especially useful for establishing a frame for a subsequent agricultural census and surveys and for this reason is recommended by the WCA 2020 and discussed below. The use of that topic involves the collection of information intended to identify whether the household is engaged in any form of own-account agriculture (i.e. crop and/or livestock) production activities and, if that is the case, to obtain key data on farm size – such as the area of land used for agricultural production and the number of livestock (by livestock types relevant for the country). Therefore, the basic items recommended for including in the population and housing census are as follows:

Basic items

1: Whether the household is engaged in any form of own-account agriculture production

2: Measure of farm size, such as the area of land (or number of plots) used for agricultural production purposes, and the number of livestock

5.12 Basic items 1 and 2 are the minimum set of agriculture-related items for including in the population and housing census at the household level. Item 1 identifies households engaged in own-account agriculture production, covering the main activities important to a country. Item 2 requests further information on the extent of the households' agricultural activities.

5.13 Information on forestry, fishery and aquaculture activities may also be collected through the population and housing census in cases when they are important for a country. This information would facilitate the preparation of the frame when countries wish to conduct a subsequent agriculture census which goes beyond the scope of agriculture (as discussed in Chapter 6).

5.14 Countries wishing to collect more extensive data on agriculture may include an agriculture module in the population and housing census, consisting of a selection from the listed frame items of WCA 2020, such as:

Frame items (selection of appropriate items from WCA 2020):

Item 0101: Identification and location of agricultural holding

Item 0107: Main purpose of production of the holding

Item 0201: Total area of holding

Item 0301: Use of irrigation on the holding: fully and partially controlled irrigation

Item 0401: Types of temporary crops on the holding

Item 0405: Types of permanent crops on the holding and whether in compact plantations

Item 0502: Number of animals (by livestock types relevant for the country)

Item 1201: Presence of aquaculture on the holding

Item 1301: Presence of woodland on the holding

Item 1401: Engagement of household members in fishing activity

5.15 The basic and frame items listed above are primarily relevant at the household level. The required household-level information can be collected as part of the main enumeration. In the case of the basic items these can alternatively be included in the pre-census listing/cartographic phase of the population census so as not to overburden the questionnaire. This latter approach has the advantage 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.

5.16 There is usually a one-to-one match between the holding and the household with own-account agricultural production. Thus, identifying households with agricultural holdings and providing a measure

of size will supply key data which can be used when preparing a frame of holdings for the agriculture census. These will also improve sample design and data for cross-tabulations and analysis of the relationship between demographic data and agricultural activities.

5.17 The frame items recommended above for the agriculture module in the population and housing census form a subset of the WCA 2020 frame items. The frame items go beyond the basic items to cover a wider range of data on agriculture in the household sector, which could be used to provide auxiliary information for census and sample frames and for improving sample design. The inclusion of some additional frame items in the population and housing census can be useful for countries planning to conduct the agriculture census as a modular approach. In this case the core module of the modular approach can be collected during the population and housing census and the agriculture census would focus on the supplementary modules, conducted on a sample basis.

5.18 When using the agriculture module in the population and housing census it may be difficult to include all recommended frame items, and these would be selected according to particular requirements. Approaches for selecting frame items are further detailed in *Guidelines for Linking Population and Housing Censuses with Agricultural Censuses,* (FAO and UNFPA, 2012).

B. Combining the census of agriculture with the census of aquaculture

5.19 There continues to be a strong demand for structural data on aquaculture and an interest in many countries to link aquaculture with agriculture by carrying out the agricultural and aquacultural censuses together. Aquacultural data can be collected in the agriculture census by including a few items on aquacultural production only for agricultural holdings which also conduct aquaculture production or, in a joint aquaculture and agriculture census, for both agricultural and aquacultural holdings in order to collect data from aquacultural units which are not also associated with agriculture (see Chapter 8, Theme 12). The WCA 2010 introduced this idea of and this is retained in WCA 2020. This section focuses on the main issues to be considered by countries in carrying out the two censuses together. More information on the collection of aquacultural statistics may be found in Guidelines on the Collection of Structural Aquaculture Statistics (FAO, 1997b) and Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework (Global Strategy, 2015).

Scope of the aquacultural census

5.20 According to ISIC (Rev. 4), agriculture and aquaculture are separate economic activities. Aquacultural production represents activities under ISIC group 032 whereas agricultural production represents activities under groups 011 to 015 (UN, 2008). 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".

5.21 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 Chapter 8, Theme 12 "Aquaculture", paragraphs 8.12.3 – 8.12.5. A clear distinction is made between aquaculture and capture fisheries.

Statistical unit for the aquacultural census

5.22 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."

5.23 Agricultural holdings and aquacultural holdings are distinct establishment units operating in different industries under the System of National Accounts (SNA) framework of the ISIC (see Annex 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.

Methodology for a census of agriculture and aquaculture

5.24 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 10.

5.25 The frame for the census of agriculture and aquaculture can be created in various ways:

- Using 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;
- Including additional questions in the population census to identify households engaged in own-account agricultural production and/or own-account aquacultural production;
- Developing a frame of agricultural and/or aquacultural holdings from administrative sources or statistical sources, such as business registrations or statistical registers. This usually may be applicable for the non-household sector.

5.26 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 the population census, the joint census 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);
- During the census listing operation, 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;
- Add the commercial holdings and enumerate all agricultural holdings and aquacultural holdings to collect data for the census of agriculture and aquaculture.

5.27 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 0104 "Sex of agricultural holder" and 0105 "Age of agricultural holder" could be renamed the "holder", to describe the main decision-maker for either an agricultural holding or an aquacultural holding. Also, Item 0107 "Main purpose of production of the holding" would need to be amended for the aquacultural census to cover income from aquacultural production.

5.28 For a census covering aquacultural holdings, some changes in the concepts and definitions would be needed in some themes:

- ***Theme 2: Land.*** The definition of area of holding includes areas used for aquaculture, including supporting facilities, but additional aquacultural parcels would need to be defined. Parcels could consist of bodies of water. Special procedures would be needed for Item 0204 (location) where a parcel is not located in an administrative division, but in the sea. Item 0209 (use of shifting cultivation) and Item 0210 (number of years since land cleared) would not be applicable to parcels consisting of bodies of water.

- ***Theme 3: Irrigation.*** 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 include the provision of water for aquaculture as well.
- ***Theme 6: 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 0604 should include machinery and equipment used for aquacultural production. Some additional practices specific to aquaculture may also be included.
- ***Theme 7: Agricultural services.*** These items should also cover services for aquaculture. Items 0701–0704, relating to the use of credit facilities, should include credit for aquacultural purposes. Items 0705-0706, relating to sources of information and extension services, would also need to cover services for aquaculture.
- ***Theme 9: Work on the holding.*** Item 0902, working time on the holding, should include work in connection with aquaculture. Item 0903, relating to employees on the holding, should include labour used for aquacultural production. Item 0907, relating to contract work on the holding, should also include work for aquacultural production.

5.29 The need for data specific to agricultural holdings or to aquacultural holdings should also be considered in developing joint census implementation. 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.

5.30 Theme 10 on "Intra-household distribution of managerial decisions and ownership" on the holding may also need to be reviewed for a census of agriculture and aquaculture. This may need to be widened to cover both agricultural and aquacultural activities.

5.31 A country may decide to implement the joint census using the modular approach, with the core module providing a limited set of key data on the structure of agricultural and aquacultural holdings and a sample-based supplementary module providing more detailed structural data. The frame items related to basic structural data, such as household size and land use, should be included in the aquaculture census core module. It is also recommended that one additional aquaculture-related item – area of aquaculture by type of site – (see below) be included in the core module (see paragraphs 8.12.7 to 8.12.10):

1202 Area of aquaculture according to type of site (for the holding)

- *Land-based*
  - *Arable land*
  - *Non-arable land*
- *Inland waters*
- *Coastal waters*

5.32 The use of a common set of frame items for the agricultural and aquacultural censuses may make it possible to conduct the core modules of the two censuses using the same questionnaire.

5.33 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.

C. Relationship with economic censuses

5.34 The agricultural census is a component of the overall economic statistics system based on SNA and ISIC (see Annex 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. The agricultural census measures the agricultural industry and this is usually not covered in the economic census.

5.35 Economic censuses are normally carried out using the "establishment" as the statistical unit (see Annex 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:

5.36 ***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.

5.37 ***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.

5.38 ***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.

5.39 ***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.

D. Collecting additional agricultural data for households that are not agricultural producers

5.40 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 also use the agricultural census to collect limited additional data on households that are not agricultural holdings when there are few other opportunities for data collection. A widened agriculture census should be considered mainly in this context. This idea was included in WCA 2010 and has been retained. A more detailed explanation of this section can be found in WCA 2010.

5.41 Often, in an agricultural census, it is necessary to interview each household in the listing stage to identify agricultural holdings before going on to collect the required agriculture-related data from each holding. This especially applies when the agricultural census frame is obtained from the population census household lists (see paragraph 4.24). Because all households need to be interviewed in any case, it can be cost-effective and simple to collect a limited amount of additional data for all households. Some countries might be interested in collecting data specifically for households that are involved in agriculture in some way, such as households living in rural areas whose agricultural production is under the cut-off limits for the holding or households whose members are working in agriculture.

5.42 The data collection from households which are not agricultural producers is best targeted to the collection of information used to create the frame for more detailed rural surveys or for supplementary modules when the modular approach to the agriculture census is used.

Use of other data collections in the integrated statistical system to meet data needs

5.43 It is recommended that consideration first be given to meeting the need for additional data from non- agricultural producers through other data collections, rather than the agricultural census. Often, other national household surveys can be used to meet the additional agricultural data needs or data on rural households. 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 a stand-alone 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 analysing the agricultural data.

5.44 Data not normally covered in a census, such as household food security or household income, may be needed. Rather than collecting such detailed 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. The agricultural census development team should work closely with the survey data teams to coordinate work on the two census activities.

5.45 Usually, countries are able to satisfy most additional agricultural data needs directly from other data collections, such as 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.

Coverage and statistical unit of a widened agriculture census

5.46 In a wider agricultural census, data on non-agricultural production households should be strongly considered for collection during the listing phase of the agriculture census, when all households are visited. The units covered would thus be rural households defined in terms of households living in areas designated as rural areas, usually defined by the population census. 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.

5.47 Including these data would allow the possibility to cover households containing at least one member engaged in an agricultural activity. It could also include households with persons working on their own holding, as well as households with persons working as employees in agricultural jobs or households whose main source of income is from agriculture.

5.48 A widened agriculture census would normally cover the geographic areas covered by the agriculture census. In cases where other geographic areas would be covered, consideration should be given to use of other data collections, such as household surveys, to meet the data needs.

5.49 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-agricultural production households.***

Methodology and items for a wider agriculture census

5.50 Basic frame items can be collected under both the classical and modular approaches to the census. However, when more detailed data that go beyond the scope of agriculture as defined by ISIC (Rev. 4) are collected, then a wider agricultural census is best suited to the modular approach to the agriculture census. The core module can be used to collect basic frame items on non-agricultural production households, while the supplementary surveys of the modular approach provide a suitable method for collection of additional items from non-agricultural production households, which can be targeted to specific rural production activities outside of agriculture. Further details of the type of additional items are discussed in 5.51-5.54.

Modular approach: supplementary modules

5.51 When the modular approach to the agriculture census is used, the possibility exists to collect some data from non-agricultural production households as a supplementary module. The type of data collected for non-agricultural production households usually focuses on rural production activities. These may go beyond the scope of agriculture as defined under ISIC (Rev.4), such as rural labour for non-agricultural production households, fisheries activities, aquaculture or forest use, which are covered by sectors related to agriculture. Covering only agriculture holdings would not cover the total population involved in these activities. The types of items collected can cover basic frame items or also more detailed items from supplementary themes.

5.52 Some agricultural census essential frame items identified in Chapter 7 could also be applicable to non- agricultural production households – in particular: Item 0801 "Household size"; Item 1201 "Presence of aquaculture on the holding"; Item 1301 "Presence of woodland on the holding"; Item 1401 "Engagement of household members in fishing activity"; and Item 0108 "Other economic activities of the household".

5.53 Supplementary themes relevant to non-agricultural production households and suitable for a wider agriculture census are: Theme 8 "Demographic and social characteristics"; Theme 11 "Household food security"; Theme 12 "Aquaculture"; Theme 13 "Forestry" and Theme 14 "Fisheries". These modules could be particularly useful, given the wider coverage of households. Household supplementary modules or surveys could also be conducted on other themes altogether.

5.54 The number of items should be kept to a minimum and take into account data already available from the population census and elsewhere. Note that any additional items required for non-agricultural production households also need to be collected for households with own-account agricultural production.

Use of household data for agricultural holdings and non-agricultural production households

5.55 It is recommended that the analysis and dissemination of results clearly distinguish between the units of the agricultural holding and the non-agricultural production households.

5.56 When countries wish to create a combined analysis, the data from non-agricultural 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.

5.57 The definition of an agricultural holding distinguishes between the economic unit of agricultural production and the household (see paragraphs 6.7-6.14). Many countries define the two units to be equivalent, which would allow a combined analysis.

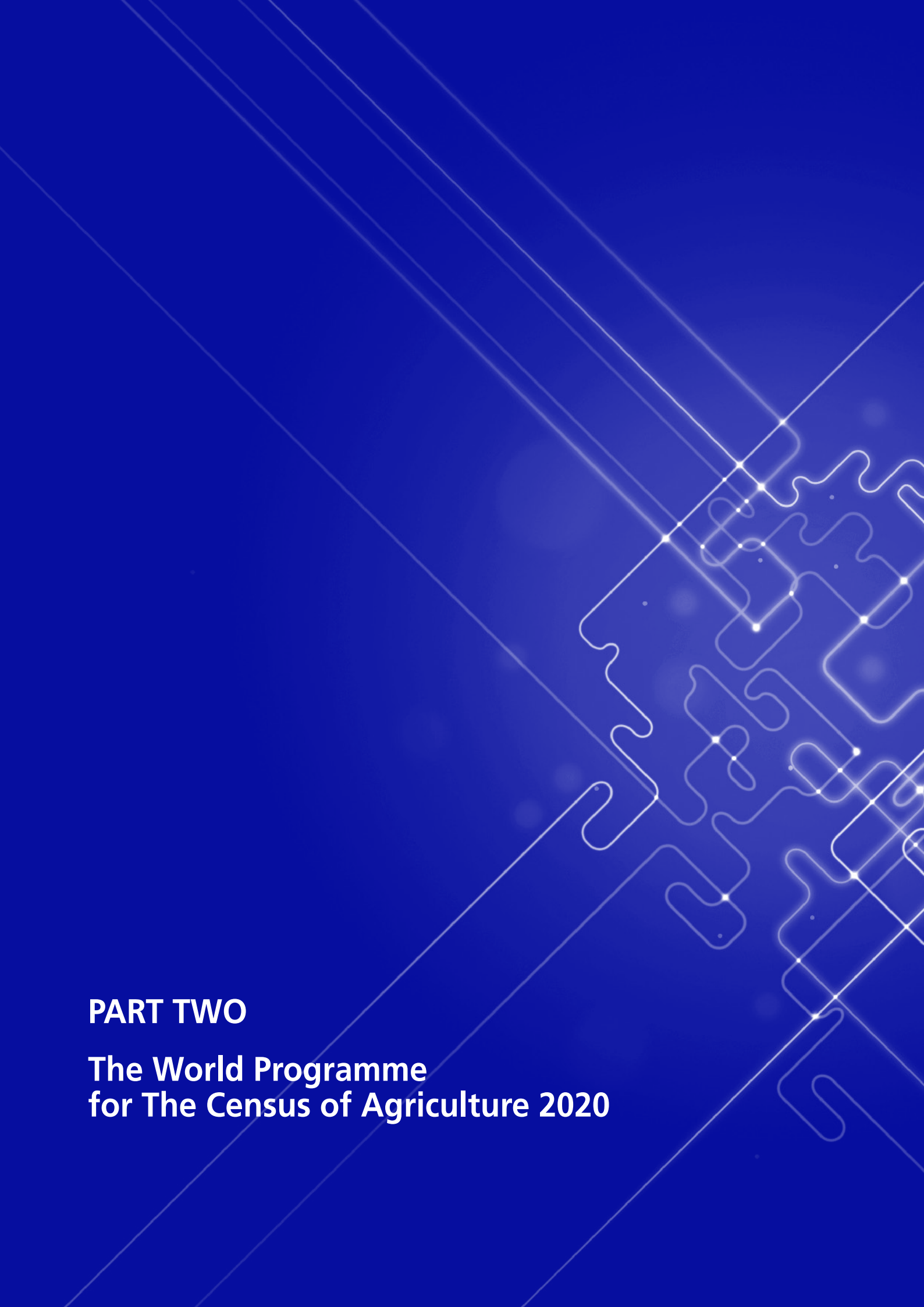
E. Fisheries module

5.58 A module on fisheries has been introduced to the WCA 2020. The module is intended for use by countries conducting a widened agricultural census that collects limited additional data on all households. There is a strong demand for data on household subsistence fishing and the module suggests items that will collect data on small-scale fishing activities at household level. It is not intended to target large-scale commercial fishing, which uses separate frames and units of enumeration.

5.59 The items covered by the module remain outside the scope of agriculture as defined under ISIC (Rev. 4). Fisheries falls under group 031, while agriculture falls under groups 011 to 015 (UN, 2008). Under this definition, fisheries and agriculture are separate economic activities, and fisheries are outside the scope of the agriculture census. Therefore, fisheries is included for countries that conduct a wider agricultural census and wish to collect additional data on households that are not agricultural holdings.

5.60 The unit of enumeration of the agriculture census is the agricultural holding. However, in a wider agricultural census, including items from the module on fisheries, additional units would be covered, namely rural households engaged in fishing activities.

5.61 The module can be applied to countries using the classical approach to the census or the modular approach. Under the classical approach the possibility exists to include item 1401 "Engagement of household members in fishing activity" during the listing phase of the agriculture census or as part of the short questionnaire, when all households are visited in order to identify the holdings to be enumerated during the agriculture census. For countries conducting the modular approach to the census it is possible to include item 1401 as part of the core module. Items 1402 to 1407, which collect further structural data on fishing, can be included as part of the supplementary surveys which target specific populations. When a wider agricultural census is conducted this can include households engaged in fishing activities.



PART TWO

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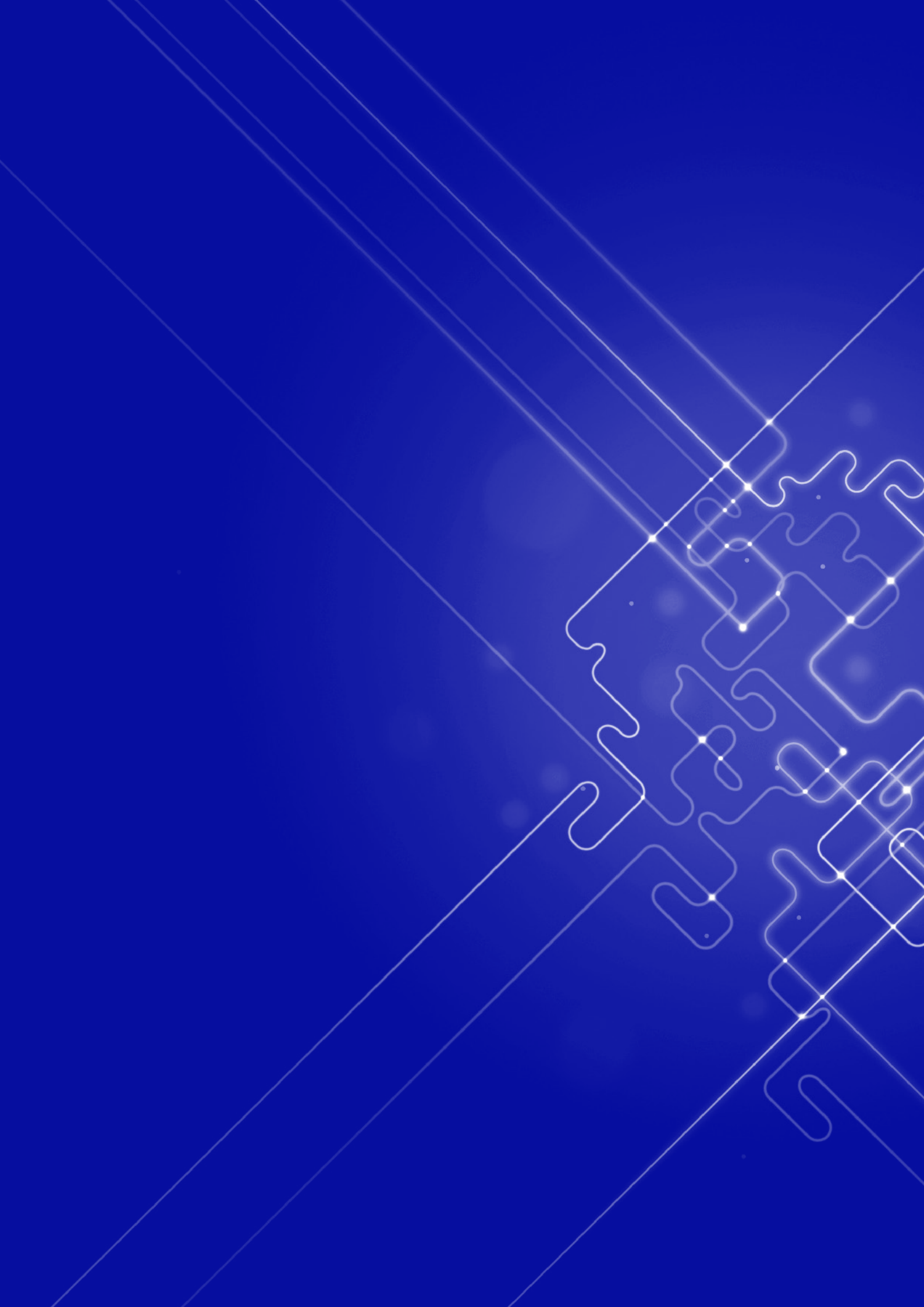


CHAPTER 6
CONCEPTS AND DEFINITIONS

This chapter presents the concepts and definitions to be considered in the development of a census of agriculture. The concepts of agricultural holding and agricultural holder remain the same as in the previous programme The census reference period is clarified and the scope, coverage and timing of the census are discussed. The steps involved in developing and undertaking an agricultural census are also summarized.

Statistical unit

6.1 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 2020.

The agricultural holding

6.2 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."

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

6.4 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 developing 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".

6.5 ***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 UN 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 resources and may have a common budget; they may be related or unrelated persons, or constitute a combination of persons both related and unrelated" (UN, 2015b, paragraph 2.33).

6.6 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.

6.7 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 (either for sale or for own use); 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 to pool their 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.

6.8 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. In this case, there are two agricultural holding units associated with the household and two sets of activities: (i) the agricultural production activities of the individual household itself; and (ii) the joint agricultural operations with the other household(s).

6.9 In the past, some countries have found it difficult to apply the agricultural holding concept strictly 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. Countries see several benefits to equating the agricultural holding and household units:

- The identification of the holding in the agricultural census is simplified; it is no longer necessary to find out about multiple holdings within the same household.
- It brings 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 – enables the agricultural census to be more easily linked to the population census.
- It facilitates the analysis of household characteristics.
- If the scope of the agricultural census is expanded to include other households not engaged in own-account agricultural production, there will be a common unit between agricultural production units and other households.

6.10 Countries should consider the advantages of defining the agricultural holding unit in the household sector in this way, taking into account operational considerations and the issues mentioned above. The definition of the holding (see paragraph 6.2) and the coverage of the agriculture census (see paragraphs 6.26-6.29) should be clearly stated in the census dissemination products to help clarify interpretation of data.

6.11 Care must be taken 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 Annex1), whereby an establishment is an economic unit engaged in one main productive activity, operating in a single location.

6.12 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 definition of holding describes the different parcels making up the holding as "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.

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

- 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 separate holding.
- 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.

6.14 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 on the census reference day 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 principle can be difficult to apply in practice.
- 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 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 duplicate counting of land. If this is a common practice in the country, it should be clearly indicated in the tabulations and explained in the metadata report.

Parcel, field and plot

6.15 The agricultural holding is divided into parcels, such that a parcel is any piece of land of one land tenure type (see paragraphs 8.2.36 – 8.2.40) 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 for collecting data on the parcel is a point of time, usually the census reference day.

6.16 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, fences, waterways 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, or which is fallow or waiting to be planted.

Agricultural holder

6.17 ***The agricultural holder*** is defined as the civil person, group of civil persons 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.

6.18 By definition, the agricultural holding is under single management, exercised by the holder (civil person, group of civil persons or juridical person). The concept of an agricultural holder is often difficult to apply because of the complex decision-making processes on the holding. If there is one person making the major decisions regarding resource use and exercising management control over the agricultural holding operations, he/she should be defined as ***the holder.*** Sometimes, the holder can be a group of civil persons – members of the same household (such as a husband and wife) or from different households – called joint holders. ***Joint holder*** is defined as a person making the major decisions regarding resource use and exercising management control over the agricultural holding operations, in conjunction with another person.

6.19 The agricultural holder in the household sector 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. The ***hired manager*** of the holding is the person who manages an agricultural holding on behalf of the agricultural holder and is responsible for the normal daily financial and production routines of running the holding. The hired manager is a paid employee.

6.20 Some countries may wish to provide more detailed information on the management of the holding. In addition to the items regarding agricultural holder and hired manager of the agriculture holding, Theme 10 "Intra-household distribution of managerial decisions and ownership on the holding" reflects this need. For more information, see paragraphs 8.10.1 – 8.10.19.

6.21 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 which person 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 when identifying the agricultural holder. As with all data collection, questionnaires must be carefully designed and tested, and enumerators must be well-trained and closely supervised.

Scope of the census of agriculture

6.22 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, focusing only on those units engaged in the production of crop and livestock products. Units engaged in forestry and fisheries were not covered unless they also had some crop or livestock production activities.

6.23 For the 2020 round of agricultural censuses, it is recommended that the scope of the agricultural census remain the same as in previous programmes. However, it is recognized that other activities outside the agricultural production industry, such as aquaculture, are becoming increasingly important in many parts of the world. In WCA 2010, countries were encouraged to conduct an aquaculture census in conjunction

with the agricultural census, in cases where there was a need for such data. Having a joint census continues to be a feature in WCA 2020. Further information on the aquaculture census is given in Chapter 5.

6.24 International statistical standards for defining areas of economic activity have been established by ISIC (UN, 2008). For more information on ISIC, see Annex 2 and Annex 3. The scope of an agricultural census may be defined under ISIC (Rev.4) (See Annex 2) as follows:

- Group 011: Growing of non-perennial crops
- Group 012: Growing of perennial crops
- Group 013: Plant propagation
- Group 014: Animal production
- Group 015: Mixed farming

6.25 The scope should be clearly stated in the census dissemination products to help in the interpretation of data (see paragraph 6.10).

Coverage of the census of agriculture

6.26 Ideally, an agricultural census should cover all agricultural activity in a country according to the above ISIC groupings. However, for operational reasons, sometimes countries omit certain areas of the country, such as urban areas, remote areas or areas with security problems. Countries should decide on any out-of-coverage 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 agricultural activities of the military are excluded; schools and religious organizations are also omitted.

6.27 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.

6.28 It should be recognized that, in an integrated agricultural statistics system, any exclusions from the agricultural census affect 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-coverage units, and agricultural production estimates from the survey will be affected accordingly.

6.29 Countries should clearly specify the coverage in the presentation of agricultural census results. When certain geographic areas are excluded, this should be highlighted in the census dissemination products to help users interpret and analyse the results.

Cut-off threshold

6.30 Many countries apply a minimum size limit for inclusion of units in the census. 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 developing 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 (See 3.22 – 3.25).

6.31 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. Setting a minimum value of agricultural production is difficult to apply, especially when a large part of the agricultural output is for the

household's own consumption. Minimum size limits are often also difficult to apply, especially for livestock numbers, where one needs to have multiple criteria involving numbers of each type of livestock. In any case, the threshold criteria should be clearly stated in the census report to help users interpret and analyse the results.

6.32 An alternative to setting 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 that 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.

Agricultural census reference period

6.33 The census has two main reference periods – namely, the ***census reference* year** and the ***census reference day.*** The census reference year 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. Use of the agricultural year has the advantage that respondents often think of their activities in seasonal terms and thus find recall easier for this reference period. The census reference day is a point in time used for livestock numbers and other inventory items. There may be some exceptions to these census reference periods, such as in the population dynamics for some types of livestock herds (items 0507-0511) where a reference period of less than 12 months may be appropriate.

6.34 In practice, countries may wish to use "day of enumeration" instead of a fixed census reference day to facilitate the enumeration. The census reference day should then be determined as the mid-point of the main enumeration period. Likewise "the last 12 months" is commonly used instead of a fixed census reference year and here again the census reference year should be determined as the 12-month period leading up to the mid-point of the main enumeration. 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 concerns. The reference periods used should be highlighted in the census dissemination products to help users interpret and analyse the results.

Timing of the census of agriculture

6.35 WCA 2020 covers the ten-year period 2016–2025. Countries are encouraged to carry out their agricultural census as close as possible to the year 2020, to help make international comparisons more meaningful, but it is recognized that the timing of a country's census is determined by many factors, including administrative and financial considerations.

6.36 In particular, countries should take into consideration the timing implications imposed by the population and housing census, especially where the two censuses are to be coordinated. In the population and housing 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 do adhere to that recommendation.

6.37 There are many advantages to running the agricultural census soon after the population and housing census, especially as agriculture-related data and field materials will still be current. If the population and housing census is being used to develop a frame for the agricultural census, the need to conduct the agricultural census soon after the population and housing census becomes more critical, to ensure the frame remains as up-to-date as possible

Steps in developing the census of agriculture

6.38 Information on how to develop and conduct an agricultural census is given in *Conducting Agricultural Censuses and Surveys* (FAO, 1996a) and *World Programme for the Census of Agriculture 2020, Volume 2* (see paragraph 1.16). 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;
- Design data quality assurance framework;
- 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;
- Conduct census enumeration;
- Carry out post-enumeration survey;
- Perform data processing;
- Tabulate and analyse the data;
- Prepare census reports and disseminate results;
- Reconcile the data from the system of current statistics with the census data.

CHAPTER 7
LIST OF ITEMS FOR THE CENSUS OF AGRICULTURE

This chapter contains a list of items to be considered for inclusion in the census of agriculture. Distinction is made between essential, frame and additional items. The items are presented according to 15 themes, corresponding to areas of interest for the census programme. The reference group for each theme is shown, along with cross-references to the descriptions of themes and items in Chapter 8.

Introduction and changes from the earlier programme

7.1 This chapter lists the items for the census of agriculture. The list has been prepared by FAO, based on experiences of countries with previous agricultural censuses and taking into account emerging user needs as well as agricultural issues and problems faced by countries. The chapter relates only to the items that can be reported by the agricultural holding; items for the community survey are discussed in Chapter 9.

7.2 To help countries meet the need for a wider range of data, WCA 2010 introduced the concept of a modular approach for the census of agriculture. This approach had a "core census module", conducted on a complete enumeration basis, and one or more "census supplementary modules", conducted on a sample basis. A recommended list of 16 items was proposed for the core module and these items were also FAO's recommended minimum set of data for the WCA 2010 round of agricultural censuses. This approach differed from the previous census rounds for which the classical approach was the norm and a subset of items were classified as "essential" for national and international comparison purposes. In WCA 2000, 26 items were classified as essential.

7.3 While the modular approach was used by a number of countries in the WCA 2010 round, the most common approach remained the classical approach. Countries also found the 16 core items too restrictive as a minimum data set. The absence of data on crop areas harvested and on employment, in particular, was noted. A review of the core items concluded that they were particularly relevant for frame construction for the census supplementary modules but some items were less appropriate as essential items.

7.4 For this reason WCA 2020 now distinguishes between "essential" items and "frame" items. The essential items are those that every country should collect, regardless of the methodological approach used for the agricultural censuses, as they are needed for national purposes and international comparisons, whereas the frame items are used primarily for building the frame for supplementary modules or subsequent surveys and relate specifically to censuses using the modular approach. Some frame items are also essential (e.g. Item 0107 "Main purpose of the production of the holding"), meaning that they are useful for both purposes, but many frame items are not classified as essential.

7.5 Other items in the census programme are additional items with no distinction regarding their particular suitability for the classical or modular approach.

7.6 WCA 2020 introduces a number of new items. Some of them are totally new (e.g. Item 0901 "Whether working on the holding is the main activity"). Some of the new items are re-introduced (e.g. Item 0111 "Presence of hired manager"). There are also new items which are components of more detailed existing items. These are both essential and frame items (e.g. frame Item 0602 "Use of genetically modified seeds" is a component of Item 0603 "Use of genetically modified seeds according to crop type").

7.7 In the process of harmonizing the concepts and definitions in the WCA 2020 with international classifications and standards, some items introduced in the WCA 2010 have been modified (e.g. Item 1301

"Presence of woodland on the holding" replaces the WCA 2010 Item 0015 "Presence of forests and other wooded land on the holding") but they are not considered to be new items.

7.8 WCA 2020 has a total of 128 items, of which 23 are essential items, 15 are frame items and 96 are additional items. Note that some of the items are both essential and frame. The items are grouped according to 15 themes. All items have a unique 4-digit number. The first two digits refer to the number of the theme where they are described and the next two digits refer to the sequence of the items within the theme, starting from 01 for each theme. For example, the number for Item 0107 "Main purpose of production of the holding" is composed of "01" which represents the number of Theme 1 "Identification and general characteristics" and "07" which represents the 7th item in this theme.

Essential items

7.9 There are 23 essential items. These items are considered the minimum data set that all countries should collect, regardless of the methodological approach used. They are important to compile a minimum set of national indicators on the agricultural sector needed for agricultural policy-making and planning. Data for these items are required for small administrative units such as districts or villages, or in the form of detailed cross-tabulations; these items are required for international comparison purposes.

7.10 All new items are marked with a "+". However, some of the new essential items are components of existing items. For example, Item 0503 "Number of female breeding animals" is a component of two additional Items – 0504 "Number of animals: sex and age" and 0505 "Number of animals according to purpose".

List of recommended ESSENTIAL items

(+ denotes new items)

	0101	Identification and location of agricultural holding
	0103	Legal status of agricultural holder (type of holder)
	0104	Sex of agricultural holder
	0105	Age of agricultural holder
	0107	Main purpose of production of the holding
	0108	Other economic activities of the household
	0201	Total area of holding
	0202	Area of holding according to land use types
+	0203	Area of holding according to land tenure types
+	0302	Area of land actually irrigated: fully controlled and partially controlled irrigation
	0402	Area of temporary crops harvested (for each temporary crop type)
	0406	Area of productive and non-productive permanent crops in compact plantations (for each permanent crop type)
	0407	Number of permanent crop trees in scattered plantings (for each tree crop)
	0411	Use of each type of fertilizer
	0501	Type of livestock system
	0502	Number of animals
+	0503	Number of female breeding animals
	0601	Use of agricultural pesticides
	0801	Household size by sex and age groups
+	0901	Whether working on the holding is the main activity
	0902	Working time on the holding
	0903	Number and working time of employees on the holding by sex
	1201	Presence of aquaculture on the holding

Frame items

7.11 There are 15 frame items, six of which are also essential items. The frame items are directly relevant to frame construction for the supplementary modules for countries using the modular approach and for subsequent surveys. For example, frame Item 0401 "Types of temporary crops on the holding" can be used for a supplementary module or specialized annual survey on "Production of temporary crops"; frame Item 0405 "Types of permanent crops on the holding and whether in compact plantations" can be used for a supplementary module or specialized annual survey on "Production of permanent crops"; frame Item 0201 "Total area of holding" can be used for a supplementary module or a specialized survey on agricultural practices applied on holdings with land. Countries may include additional items for use in creating sampling frames for the census supplementary modules or the programme of agricultural surveys according to their needs.

7.12 Some frame items are a component of existing items for the purpose of building a frame (e.g. Item 0413 "Presence of nurseries"). They are denoted as new items. The items specifically identified for frame construction are:

List of recommended FRAME items

(an "E" denotes frame items also considered essential and "+"denotes new items)

E	0101	Identification and location of agricultural holding
E	0107	Main purpose of production of the holding
E	0108	Other economic activities of the household
E	0201	Total area of holding
	0301	Use of irrigation on the holding: fully and partially controlled irrigation
	0401	Types of temporary crops on the holding
	0405	Types of permanent crops on the holding and whether in compact plantations
+	0413	Presence of nurseries
+	0415	Presence of cropped land under protective cover
E	0502	Number of animals
+	0602	Use of genetically modified (GM) seeds
E	1201	Presence of aquaculture on the holding
	1301	Presence of woodland on the holding
	1304	Whether agroforestry is practised
+	1401	Engagement of household members in fishing activity*

** Note that Fisheries is outside the scope of the agricultural census but Item 1401 "Engagement of household members in fishing activity" is included in the list of frame items as it is suitable for countries considering a wider scope.*

Items for consideration by theme

7.13 The WCA 2020 presents items grouped in themes. Each theme focuses on a specific area of interest for the agriculture census programme. All items have a unique 4-digit number; the first two digits refer to the number of the theme where they are described and the next two digits refer to the sequence of the items within the theme, starting from 1 for each theme. If an item is also relevant to another theme, only a reference to the item is included in the latter, without the full item's description. For example, Item 1304 "Whether agroforestry is practised" is described under Theme 13 "Forestry" but is also relevant to Theme 6 "Agricultural practices". Thus, in Theme 6 "Agricultural practices" a reference to Item 1304 "Whether agroforestry is practised" is made.

7.14 An "E" denotes essential items; an "F" denotes frame items; a "+" denotes new items. Additional items are not marked with a specific symbol unless they are new for the WCA 2020 (in this case they are marked with "+")

7.15 The scope of each theme is shown in parentheses under each heading. References to the applicable concepts and definitions in Chapter 8 are shown in parentheses after each item.

Theme 1 – Identification and general characteristics

For the holdings

E F	0101	Identification and location of agricultural holding (paragraphs 8.1.1 - 8.1.4)
+	0102	Respondent for the agricultural holding (paragraph 8.1.5)
E	0103	Legal status of agricultural holder (type of holder) (paragraphs 8.1.6 - 8.1.9)
E	0104	Sex of agricultural holder (paragraphs 8.1.10 - 8.1.11)
E	0105	Age of agricultural holder (paragraphs 8.1.12 - 8.1.15)
	0106	National/ethnic group of household head or agricultural holder (paragraph 8.1.16)
E F	0107	Main purpose of production of the holding (paragraphs 8.1.17 - 8.1.20)
E F	0108	Other economic activities of the household (paragraphs 8.1.21 - 8.1.23)
+	0109	Proportion of income from holding's agricultural production in household's total income (paragraphs 8.1.24 - 8.1.25)
+	0110	Main agricultural activity of the holding (paragraphs 8.1.26 - 8.1.28)
+	0111	Presence of hired manager of the agricultural holding (paragraph 8.1.29)
+	0112	Sex of hired manager of the agricultural holding (paragraph 8.1.30)
+	0113	Age of hired manager of the agricultural holding (paragraph 8.1.31)

Theme 2 – Land

For the holdings

E F	0201	Total area of holding (paragraphs 8.2.1 - 8.2.6)
E	0202	Area of holding according to land use types (paragraphs 8.2.7 - 8.2.35)
E	0203	Area of holding according to land tenure types (paragraphs 8.2.36 - 8.2.40)

For each parcel

	0204	Location (paragraphs 8.2.41 - 8.2.43)
	0205	Area (paragraph 8.2.44)
+	0206	Land use (paragraph 8.2.45)
	0207	Land tenure (paragraphs 8.2.46 - 8.2.47)
	0208	Terms of rental (for rented parcels) (paragraph 8.2.48)
	0209	Use of shifting cultivation (paragraphs 8.2.49 - 8.2.50)
	0210	Number of years since cleared (paragraphs 8.2.51 - 8.2.52)

For the holdings

	0211	Presence of soil degradation: type and degree (paragraphs 8.2.53 - 8.2.56)

Theme 3 – Irrigation

For the holdings

F	0301	Use of irrigation on the holding: fully and partially controlled irrigation (paragraph 8.3.5)
E +	0302	Area of land actually irrigated: fully controlled and partially controlled irrigation (paragraphs 8.3.6 - 8.3.7)
	0303	Area of land actually irrigated according to land use type: fully controlled and partially controlled irrigation (paragraphs 8.3.8 - 8.3.10)
	0304	Area of land actually irrigated according to method of irrigation: fully controlled irrigation (paragraphs 8.3.11 - 8.3.14)
	0305	Area of crops actually irrigated for each crop type: fully controlled irrigation (paragraphs 8.3.15 - 8.3.16)
	0306	Sources of irrigation water: fully controlled irrigation (paragraphs 8.3.17 - 8.3.19)
+		Rice cultivation: irrigation and water regimes (see Item 1506)

	0307	Payment terms for irrigation water: fully and partially controlled irrigation (paragraph 8.3.20)
	0308	Use of other types of irrigation: partially controlled irrigation (paragraphs 8.3.21 - 8.3.24)
+	0309	Area equipped for irrigation in working order: fully and partially controlled irrigation (paragraphs 8.3.25 - 8.3.27)
	0310	Presence of drainage equipment (paragraphs 8.3.28 - 8.3.29)

Theme 4 – Crops

Temporary Crops

F	0401	Types of temporary crops on the holding (paragraphs 8.4.1 - 8.4.4)
E	0402	Area of temporary crops harvested (for each temporary crop type) (paragraphs 8.4.5 - 8.4.17)
	0403	Area of temporary crops harvested according to end use (for each selected crop type) (paragraphs 8.4.18 - 8.4.20)
	0404	Production of temporary crops harvested (for each selected crop type) (paragraphs 8.4.21 - 8.4.22)

Permanent Crops

F	0405	Types of permanent crops on the holding and whether in compact plantations (paragraphs 8.4.23 - 8.4.25)
E	0406	Area of productive and non-productive permanent crops in compact plantations (for each permanent crop type) (paragraphs 8.4.26 - 8.4.30)
E	0407	Number of permanent crop trees in scattered plantings (for each tree crop) (paragraphs 8.4.31 - 8.4.32)
	0408	Area of productive permanent crops in compact plantations according to end use (for each selected permanent crop type) (paragraphs 8.4.33 - 8.4.34)
	0409	Production of permanent crops (for each selected permanent crop type) (paragraph 8.4.35)

For the holdings

	0410	Area of land used to grow temporary crops as a secondary land use (paragraphs 8.4.36 - 8.4.38)
E	0411	Use of each type of fertilizer (paragraphs 8.4.39 - 8.4.45)
	0412	Area fertilized for each type of fertilizer and major crop type (paragraph 8.4.46)
F +	0413	Presence of nurseries (paragraphs 8.4.47 - 8.4.48)
	0414	Area of nurseries (paragraph 8.4.49)
F +	0415	Presence of cropped land under protective cover (paragraphs 8.4.50 - 8.4.51)
	0416	Area of cropped land under protective cover (paragraph 8.4.52)

Theme 5 – Livestock

For the holdings

E	0501	Type of livestock system (paragraphs 8.5.3 - 8.5.4)

For each livestock type

E F	0502	Number of animals (paragraphs 8.5.5 - 8.5.7)
E +	0503	Number of female breeding animals (paragraph 8.5.8)
	0504	Number of animals: age and sex (paragraphs 8.5.9 - 8.5.10)
	0505	Number of animals according to purpose (paragraphs 8.5.11 –-8.5.12)
	0506	Number of milking animals according to milk status (paragraph 8.5.13)
	0507	Number of animals born (paragraphs 8.5.14 - 8.5.16)
	0508	Number of animals acquired (paragraphs 8.5.14 - 8.5.15, 8.5.17)
	0509	Number of animals slaughtered (paragraphs 8.5.14 - 8.5.15, 8.5.18)

	0510	Number of animals disposed of (paragraphs 8.5.14 - 8.5.15, 8.5.19)
	0511	Number of animals that have died from natural causes (paragraphs 8.5.14 - 8.5.15, 8.5.20)
	0512	Types of feed (paragraphs 8.5.21 - 8.5.22)

For the holdings

	0513	Use of veterinary services (paragraphs 8.5.23 - 8.5.24)

Theme 6 – Agricultural practices

For the holdings

E	0601	Use of agricultural pesticides (paragraphs 8.6.2 - 8.6.3)
F +	0602	Use of genetically modified (GM) seeds (paragraph 8.6.4)
	0603	Use of genetically modified (GM) seeds according to crop type (paragraph 8.6.5)
	0604	Selected machinery and equipment used on the holding by source (paragraphs 8.6.6 - 8.6.8)
	0605	Non-residential buildings (paragraphs 8.6.9 - 8.6.11)
	0606	Percentage of each major agricultural product sold (paragraph 8.6.12)
	0607	Use of organic agricultural practices (paragraphs 8.6.13 - 8.6.18)
	0608	Type of seed for each major crop type (paragraphs 8.6.19 - 8.6.22)
	0609	Source of seed inputs for each major crop type (paragraphs 8.6.23 - 8.6.24)
F		Whether agroforestry is practised (see Item 1304)
+	0610	Types of tillage practices (paragraphs 8.6.26 - 8.6.32)
+	0611	Presence of conservation agriculture (paragraph 8.6.33)
+	0612	Presence of soil conservation practices (paragraphs 8.6.34 - 8.6.36)
+		Type of animal grazing practices (see Item 1501)
E		Use of each type of fertilizer (see Item 0411)
		Area fertilized for each type of fertilizer and major crop type (see Item 0412)
		Irrigation (see Theme 3)

Theme 7– Services for agriculture

For the holdings

	0701	Receipt of credit for agricultural purposes (paragraphs 8.7.1 - 8.7.3)
	0702	Source of credit (paragraph 8.7.4)
	0703	Type of collateral for credit (paragraphs 8.7.5 - 8.7.6)
	0704	Period of loan or credit (paragraph 8.7.7)
	0705	Sources of agricultural information (paragraphs 8.7.8 - 8.7.9)
	0706	Sources of agricultural extension services used (paragraphs 8.7.10 - 8.7.14)
	0707	Travelling time to nearest periodic or permanent agricultural produce market for selling products (paragraphs 8.7.15 - 8.7.17)

Theme 8 – Demographic and social characteristics

For the holdings in the household sector

E	0801	Household size by sex and age groups (paragraphs 8.8.1 - 8.8.3)

For each household member

	0802	Sex
	0803	Age (paragraph 8.8.4)
	0804	Relationship to household head or other reference person (paragraphs 8.8.5 - 8.8.7)
	0805	Marital status (paragraphs 8.8.8 - 8.8.10)
	0806	Educational attainment (paragraphs 8.8.11 - 8.8.12)

For the holder

+	0807	Agricultural training/education of holder (paragraphs 8.8.13 - 8.8.14)

Theme 9 – Work on the holding

For each household member of working age, identifying the sex

E+	0901	Whether working on the holding is the main activity (paragraph 8.9.21)
E	0902	Working time on the holding (paragraphs 8.9.22 - 8.9.26)

For the holdings

E	0903	Number and working time of employees on the holding by sex (paragraphs 8.9.27 - 8.9.32)

For each household member of working age, identifying the sex

	0904	Labour force status (paragraphs 8.9.33 - 8.9.34)

For each household member in employment, identifying the sex

	0905	Status in employment of main job (paragraphs 8.9.35 - 8.9.46)

For the holdings

	0906	Form of payment for employees (paragraph 8.9.47)
	0907	Use of contractors for work on the holding according to type (paragraphs 8.9.48 - 8.9.50)

Theme 10 – Intra-household distribution of managerial decisions and ownership on the holding

For the holdings in the household sector

+	1001	Sex of household members making managerial decisions (paragraphs 8.10.7 - 8.10.8)
+	1002	Area of crops by sex of the person managing them (paragraphs 8.10.9 - 8.10.10)
+	1003	Number of livestock by sex of the person managing them (paragraphs 8.10.11 - 8.10.12)
+	1004	Area of land owned by sex of the owner (paragraphs 8.10.14 - 8.10.16)
+	1005	Number of livestock owned by sex of the owner (paragraphs 8.10.17 - 8.10.19)

Theme 11 – Household food security

For the holdings in the household sector or all households

+	1101	The food insecurity experience scale (FIES) (paragraphs 8.11.12 - 8.11.30)
	1102	Effects of natural disasters (paragraphs 8.11.31 - 8.11.33)
	1103	Extent of loss of agricultural output due to natural disasters (paragraphs 8.11.31, 8.11.34 - 8.11.35)

Theme 12 – Aquaculture

For agriculture holdings or aquaculture holdings

E F	1201	Presence of aquaculture on the holding (paragraphs 8.12.2 - 8.12.6)
	1202	Area of aquaculture according to type of site (paragraphs 8.12.7 - 8.12.10)
	1203	Area of aquaculture according to type of production facility (paragraphs 8.12.11 - 8.12.16)
	1204	Type of water (paragraphs 8.12.17 - 8.12.18)
	1205	Sources of water for aquaculture (paragraph 8.12.19)
	1206	Type of aquacultural organism cultivated (paragraphs 8.12.20 - 8.12.21)

For the modular approach, the reference group is holdings with aquaculture production activities in frame item 1201.

Theme 13 – Forestry

For the holdings

F	1301	Presence of woodland on the holding (paragraphs 8.13.1 - 8.13.4)
	1302	Area of woodland (paragraph 8.13.5)
	1303	Purposes of woodland (paragraphs 8.13.6 - 8.13.11)
F	1304	Whether agroforestry is practised (paragraphs 8.13.12 - 8.13.13)

For the modular approach, the reference group is holdings with woodland in frame item 1301.

Theme 14 – Fisheries

For the holdings in the household sector or all households

F +	1401	Engagement of household members in fishing activity (paragraphs 8.14.4 - 8.14.8)
+	1402	Number of household members engaged in fishing activity by sex (paragraphs 8.14.9 - 8.14.12)
+	1403	Number of fishers by sex employed by the household (paragraph 8.14.13)
+	1404	Access arrangements for fishing (paragraphs 8.14.14 - 8.14.15)
+	1405	Main purpose of household fishing activity (paragraphs 8.14.16 - 8.14.17)
+	1406	Type of fishing vessel used by source (paragraph 8.14.18)
+	1407	Type of fishing gear used (paragraphs 8.14.19 - 8.14.21)

For the modular approach, the reference group is households with fishing activities in frame item 1401.

Theme 15: Environment / GHG emissions

For the holdings

E		Type of livestock system (see Item 0501)
		Number of animals: age and sex (see Item 0504)
		Number of animals according to purpose (see Item 0505)
+	1501	Type of animal grazing practices (paragraphs 8.15.8 - 8.15.15)
+	1502	Manure application (paragraph 8.15.16)
+	1503	Manure management system (paragraphs 8.15.17 - 18.15.19)
+	1504	Final use of the treated manure (paragraphs 8.15.20 - 8.15.21)
E		Use of each type of fertilizer (see Item 0411)
		Area fertilized for each type of fertilizer and major crop type (see Item 0412)
+	1505	Length of the growing period for rice cultivation (paragraph 8.15.25)
+	1506	Rice cultivation: irrigation and water regimes (paragraphs 8.15.26 - 8.15.31)
+	1507	Organic amendments to soils used for rice cultivation (paragraphs 8.15.32 - 8.15.37)
+	1508	Crop residues (paragraphs 8.15.38 - 8.15.43)
+	1509	Permanent crops: age of plantations (paragraphs 8.15.44 - 8.15.45)
+		Types of tillage practices (see Item 0610)

Symbols used: E denotes essential item; F denotes frame item; + denotes new item.

Community-level items

7.16 In addition to items collected at holding level the WCA 2020 also proposes items to be collected at community level (see Chapter 9). They may be used to complement the data on holdings in the agricultural census. These items are of interest especially for decentralized planning, planning of targeted area development programmes and examining the infrastructure and services available to agricultural holdings. The WCA 2020 recommends the following items:

Geography

	2101	Location (paragraph 9.22)
	2102	Agro-ecological, climatic, topographical or soil types (paragraph 9.23)

2103 Land use (paragraph 9.24)
2104 Area of communal grazing land (paragraphs 9.25 - 9.26)
2105 Area of communal forest (paragraphs 9.25 - 9.26)
+ 2106 Communal area under water used for aquaculture (paragraphs 9.25 - 9.26)
2107 Travelling time and the associated mode of travel to the nearest major urban centre (by season, if applicable) (paragraph 9.27)
2108 Whether the community has year-round access to the nearest urban centre by a motorable road (paragraph 9.27)
2109 Whether the community is prone to natural disasters, such as droughts and floods (if applicable) (paragraph 9.28)

Socio-economic conditions

2201 Population according to population group (paragraph 9.29)
2202 Number of households (paragraph 9.29)
2203 Economic status (if applicable) (paragraph 9.30)
2204 Main economic activities (paragraph 9.31)
2205 Whether there are seasonal food shortages (if applicable) (paragraph 9.32)

Community infrastructure and services

2301 Presence of a fertilizer dealer; if not, travelling time to the nearest fertilizer trading centre (by season, if applicable) (paragraph 9.33)
2302 Presence of a pesticides dealer; if not, travelling time to the nearest pesticides trading centre (by season, if applicable) (paragraph 9.33)
2303 Presence of a seed dealer; if not, travelling time to the nearest seed trading centre (by season, if applicable) (paragraph 9.33)
2304 Presence of a credit institution; if not, travelling time to the nearest credit institution (by season, if applicable) (paragraph 9.33)
2305 Presence of irrigation facilities (paragraph 9.33)
2306 Area equipped for irrigation (paragraph 9.33)
2307 Availability of veterinary services (if needed, further broken down by specific types: animal health post/clinic, veterinarian, animal health assistant, dipping tank); if not, travelling time to the nearest veterinary services (by season, if applicable) (paragraph 9.33)
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) (paragraph 9.33)
2309 Whether the community is covered by the agricultural produce collection network (paragraph 9.33)
2310 Presence of food storage facilities; if not, travelling time to the nearest food storage facility (by season, if applicable) (paragraph 9.33)
2311 Presence of agricultural processing facilities; if not, travelling time to the nearest agricultural processing facility (by season, if applicable) (paragraph 9.33)
2312 Presence of facilities for maintaining agricultural machinery (paragraph 9.33)
2313 Existence of farmers' associations, cooperatives and other bodies providing support and services to farmers (paragraph 9.33)
2314 Availability of agricultural extension service (paragraph 9.33)
2315 Whether electricity is connected (paragraph 9.33)
2316 Presence of a primary school; if not, travelling time to the nearest primary school (by season, if applicable) (paragraph 9.33)
2317 Presence of a health facility; if not, travelling time to the nearest health facility (by season, if applicable) (paragraph 9.33)

2318 Presence of radio, telephone (including mobile phone coverage), and Internet services (paragraph 9.33)

2319 Availability of public transport: bus, train, boat; if not, travelling time to the nearest bus station, train station, dock, etc. (by season, if applicable) (paragraph 9.33)

Development programmes

2401 Presence of specific development projects in the community (paragraph 9.34)

CHAPTER 8

DESCRIPTION OF THEMES AND ITEMS FOR THE CENSUS OF AGRICULTURE

This chapter contains a description of the themes and concepts and definitions for the agricultural census items given in Chapter 7. 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

8.1 This chapter provides a description of the themes and concepts and definitions for the agricultural census items shown in Chapter 7. 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, unless a new international standard has been adopted.

8.2 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.

8.3 It is recognized that countries will need to adapt the concepts and definitions 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 the concepts and definitions given in this chapter, 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.

8.4 For each agricultural census item described in this chapter the recommended reference period is provided. There are two main reference periods recommended, namely the ***census reference year*** and the ***census reference day*** (see Chapter 6, paragraphs 6.33- 6.34). The census reference year 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. The census reference day is a point in time used for livestock numbers and other inventory items.

THEME 1: IDENTIFICATION AND GENERAL CHARACTERISTICS

0101 Identification and location of agricultural holding

Essential and Frame item. Reference period: census reference day

8.1.1 Identification of agricultural holding usually includes holding's name, holder's name, holder's address and other contact information (telephone number, electronic mail address, etc.) and holding's location. Note that holding's location may be different from the holder's address in which case both are collected.

8.1.2 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 defined as the place where all or most of the agricultural production occurs – where administrative or farm buildings and agricultural machinery are located or, in case there is no administrative or farm building, where the majority of the land is located. Sometimes, the location of each parcel is also identified (see Chapter 8, Theme 2 Land, paragraph 8.2.43).

8.1.3 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/or 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.

8.1.4 Other types of geo-coding systems can also be used, such as direct geo-referencing of holdings with the use of GPS or by using cadastral maps. The geo-coding system can improve the presentation of census results through GIS and enables linking of the agricultural census data to other data sets. Countries are encouraged to move in this direction.

0102 Respondent for the agricultural holding

Reference period: census reference day

8.1.5 Respondent is the person from whom data are collected about the statistical unit. This item can be used for quality assessments and checks. The respondent should be someone sufficiently knowledgeable to answer the census questions accurately; usually this is the holder or hired manager. The name and the position of the respondent in the holding are usually asked.

0103 Legal status of agricultural holder (type of holder)

- A civil person
- Group of civil persons
- Juridical person

Essential item. Reference period: census reference day

8.1.6 The term "Legal status of the holder" or "Type of holder" is not necessarily confined to the holder's legal characteristics; it concerns broader aspects of identifying specific types of holdings. From the juridical point of view, a holding may be operated by civil persons, either by a single individual, or jointly by several individuals (group of civil persons) belonging to the same or to different households, with or without contractual agreement. A holding can also be operated by a juridical person who is neither an individual nor a group of individuals, such as a corporation, a cooperative, a governmental institution, a church, etc. The information on type of holder is an important classification item, especially in combination with other main classification items (see Chapter 10, Table 1).

8.1.7 The sector to which the holding belongs may be classified as "household sector" or "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.

8.1.8 ***Non-household*** sector 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 ownership, joint ownership, or leasehold are combined to various degrees. Other non-household sectors include 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.

8.1.9 Correspondence between legal status of the holder (type of holder) and the sector to which the holding belongs is not straightforward and depends greatly on the country legal system and context. For instance, a holding can be registered as a legal entity, but function as a household holding. Such a holding is usually considered to be part of the household sector but some countries may classify it in the non-household sector.

0104 Sex of agricultural holder

- Male
- Female

Essential item. Reference period: census reference day

8.1.10 Item 0104 is important for analysing 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.

8.1.11 Data on sex of agricultural holder are collected only for holdings in the household sector. For holdings in the non-household sector (corporations, government institutions, etc.) the sex of the hired manager is collected (see Item 0112) and where there are joint holders in a holding in the household sector, the sex of each person should be reported. For the definition of an agricultural holder, see paragraphs 6.17-6.19. See Chapter 10, Table 1 for information on how to tabulate sex of holder data.

0105 Age of agricultural holder

Essential item. Reference period: census reference day

8.1.12 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 analysing gender issues.

8.1.13 Age refers to the age in completed years at the time of the census. Where there are joint holders in a holding in the household sector, the age of each person should be reported. For the definition of an agricultural holder, see paragraphs 6.17-6.19. See Chapter 10, Table 1 for information on how to tabulate age of holder data.

8.1.14 This item is collected only for holdings in the household sector. For holdings in the non-household sector (corporations, government institutions, etc.) the age of the hired manager is collected (see Item 0113) and where there are joint holders in a holding in household sector, the age of each person should be reported. See Table 1 for information on how to tabulate age of holder data.

8.1.15 For the definition of an agricultural holder, see paragraphs 6.17-6.19.

0106 National/ethnic group of household head or agricultural holder

Reference period: census reference day

8.1.16 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 must be designated, and this is usually done by referring to the household head or the agricultural holder. However, this may not always be appropriate. The national/ethnic groups used by a country should be consistent with the population census and other national statistics.

0107 main purpose of production of the holding

- Producing mainly for own consumption
- Producing mainly for sale

Essential and Frame item. Reference period: any suitable reference period, such as the main harvest or the census reference year.

8.1.17 The aim of this item is to get a broad indicator of the extent to which agricultural holdings are participating in the market economy. Data on the purpose of production are usually collected for agricultural holdings in the household sector. However, some countries may also wish to collect this information for particular types of holdings in the non-household sector (schools, religious institutions, etc.).

8.1.18 In cases where a holding sells some produce and uses the rest for own consumption, main purpose should be which of the two – own 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, as gifts or as payment of taxes – should not be considered in assessing the main purpose of production. Several questions may be needed to obtain data for this item.

8.1.19 In some cases a more detailed identification of participation in the market economy by small producers would be needed – for instance, to identify holdings where the main purpose of production is for own consumption but some sale takes place when there is a surplus. The following categories allow for this:

- Producing only for sale
- Producing mainly for sale with some own consumption
- Producing mainly for own consumption with some sales
- Producing only for own consumption

Reference period: holding's actual use of the production over the census reference year.

8.1.20 One use is for developing a frame for a survey of farm food stocks for sale, in which case the item should be collected together with 0605 Non-residential buildings and the above categories should be used.

0108 Other economic activities of the household

- Support activities to agriculture and post-harvest crop activities
- Hunting, trapping, and related service activities
- Forestry and logging
- Fishing and aquaculture
- Manufacturing
  - Processing of agricultural products (agroprocessing)
  - Handicrafts
- Wholesale and retail trade, repair of motor vehicles and motorcycles
- Hotels and restaurants (excluding agrotourism)
- Agrotourism
  - Other

Essential and Frame item. Reference period: census reference year

8.1.21 An agricultural holding in the household sector consists of the agricultural production activities of an enterprise, where the enterprise is a household. A household containing an agricultural holding may be engaged in economic activities other than agricultural production. For example, a household may operate a shop or restaurant, in addition to operating the agricultural holding. Item 0108 is included in this theme to help understand the relationship between agricultural production activities and other economic activities and to find out more about life and economics in the rural areas.

8.1.22 Other economic activities are economic activities undertaken by the household linked to the premises of the agricultural holding, or in the close vicinity, 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 in an agricultural or non-agricultural capacity on the holding itself or for a business not associated with the holding.

8.1.23 The activity categories listed above are based on ISIC (Rev. 4) codes (UN, 2008), except for the agrotourism category. Countries may wish to use detailed breakdowns of the ISIC activities – for example, ISIC groups or classes (for more information, see Annex 2) for their national purposes. Agrotourism means all activities in tourism, accommodation services, showing the holding to tourist or other groups, sport and recreation activities, etc., where either land, buildings or other resources of the holding are used. Agrotourism is not a separate group in ISIC. However, considering the increasing importance of this activity, agrotourism is inserted as a separate category in the list above. The last category, Other, covers all other economic production activities in ISIC (Rev. 4), including activities related to construction and transportation.

0109 Proportion of income from holding's agricultural production in household's total income

- Less than a quarter
- A quarter to less than a half
- A half to less than three-quarters
- Three-quarters to less than all
- All income

Reference period: census reference year

8.1.24 The aim of this item is to get a broad indicator of the extent to which agricultural holdings rely on their own production for the total household income. Data for this item are collected only for agricultural holdings in the household sector. Together with data from item 0108, an indication about the holding's diversification could be obtained. This item gives information needed for distinction between subsistence agriculture and agricultural production as recreational or leisure activities.

8.1.25 The income from the holding's agricultural production is calculated as the total value of the available production from the census reference year that will be sold, used as a means of production, processed by the household, consumed in the household, put into storage or used as own-account produced fixed capital good.

0110 Main agricultural activity of the holding

- Mainly crop production
- Mainly livestock production
- Mixed (crop and livestock)

Reference period: census reference year

8.1.26 The aim of this item is to get an indicator of the main agricultural production activity of the holding. Combined with other data it could be used for formulation of policies for the agricultural sector.

8.1.27 An agricultural holding is oriented to only one of the above mentioned categories. It falls under the "crop production" category when at least two-thirds of the total value of the holding's production in the census reference year comes from crop production. An agricultural holding falls under the "livestock production" category when at least two-thirds of the total value of the holding's production in the census reference year comes from livestock production. If neither crop nor livestock production account for at least two-thirds of the total value of the holding's production, the holding is classified as mixed (crop and livestock). The value of the holding's production means the total potential value of the available production in the census reference year which will be either sold, used as a means of production, processed by the household, consumed in the household, put into storage or used as own-account produced fixed capital good.

8.1.28 When calculating the total value of production, often agricultural holdings do not include the production for own consumption. It is important to ask for all agricultural products produced in the census reference year, regardless of their destination; otherwise the information would be incomplete and the agricultural holding could be wrongly classified. Several questions may be needed to obtain data for thisitem.

0111 Presence of hired manager of the agricultural holding

Reference period: census reference day

8.1.29 The hired manager of the holding is the person who manages an agricultural holding on behalf of the agricultural holder and is responsible for the normal daily financial and production routines of running the holding. The hired manager is a paid employee.

0112 Sex of hired manager of the agricultural holding

- Male
- Female

Reference period: census reference day

8.1.30 This item is important for analysing the gender aspects of agricultural production. It could also be useful as basis for a sampling frame for special gender surveys.

0113 Age of hired manager of the agricultural holding

Reference period: census reference day

8.1.31 Age of hired manager is important for studying the relationship between age and the characteristics of agricultural holdings and, in particular, to compare the agricultural practices used by young and old managers. Age refers to the age in completed years at the time of the census.

THEME 2: LAND

0201 Total area of holding

Essential and frame item. Reference period: census reference day

8.2.1 Total area of holding is the area of all the land making up the agricultural holding. It provides a measure of the size of the holding, which is an important element in the agricultural census analysis. 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.

8.2.2 The land area of a holding may be, according to the national circumstances, insignificant, or even zero, but nevertheless, the holding could have an agricultural activity. For example, some holdings without any land used for agricultural production may raise their livestock only on communal land. In this case the agricultural holding could be considered as landless.

8.2.3 The holding's land may consist of one or more land parcels, located in one or more separate areas or in one or more 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. More information on defining holding units when land is located in more than one administrative unit is presented in paragraph 6.12. Often, land data are collected parcel by parcel and the total area of holding is derived by adding the area of each parcel.

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

- land used for growing crops (temporary and permanent, including cropped land under protective cover, see paragraph 8.4.50), meadows and pastures, and fallow land;
- unutilized agricultural land;
- forest and other wooded land;
- bodies of water;
- farmyards 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.

8.2.5 The following special cases should be noted:

- When 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 mainly for residential purposes.
- Where shifting cultivation is present, the area of the holding should include the area under crops and the area prepared for cultivation but not sown or planted as of the census reference day. Land abandoned prior to the census reference day 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. Nevertheless, such agricultural land, which does not belong directly to any agricultural holding, might be covered by the census through community-level data collection, as recommended in Chapter 9.

8.2.6 Data on area of holding must refer to a point of time, i.e. to the census reference day. In cases where a holder bought land prior to the census reference day, the area of land bought should be included in the area of the holding; in cases where a holding sold land prior to the census reference day, the area sold should be excluded. See paragraph 6.14 for more information.

0202 Area of holding according to land use types

Essential item. Reference period: census reference year

8.2.7 This item provides a breakdown of the total area of the holding collected in Item 0201 according to land use. While data on total area of the holding are based on the census reference day (see paragraph 8.2.6), in determining land use reference is made to the activities carried out during the census reference year.

8.2.8 At the moment of publication of WCA 2010, there was no internationally accepted standard land use classification. The situation has changed since then. In 2012, at its forty-third session, the UNSC adopted the System of Environmental-Economic Accounting (SEEA)-Central Framework as an international statistical standard. Classification of land use is part of this SEEA-Central Framework standard. Therefore, the land use classes recommended by WCA 2020 are harmonized with the SEEA Land Use Classification.

8.2.9 In its basic form, the SEEA Land Use Classification covers land in the sense of terrestrial areas and inland waters, but in extended form it may also cover coastal waters and Exclusive Economic Zones (EEZ) of a country. According to SEEA, land use reflects both: (i) the activities undertaken; and (ii) the institutional arrangements put in place for a given area for the purposes of economic production or the maintenance and restoration of environmental functions. Use of an area implies the existence of some human intervention or management. Land in use therefore includes, for example, protected areas that are under the active management of institutional units of a country for the purpose of excluding economic or human activity from that area. The SEEA Land Use Classification also covers areas not in use in order to provide a complete accounting of the land within a country.

8.2.10 Land use should be distinguished from "land cover", which describes the physical characteristics of the land, such as grassland or forest.

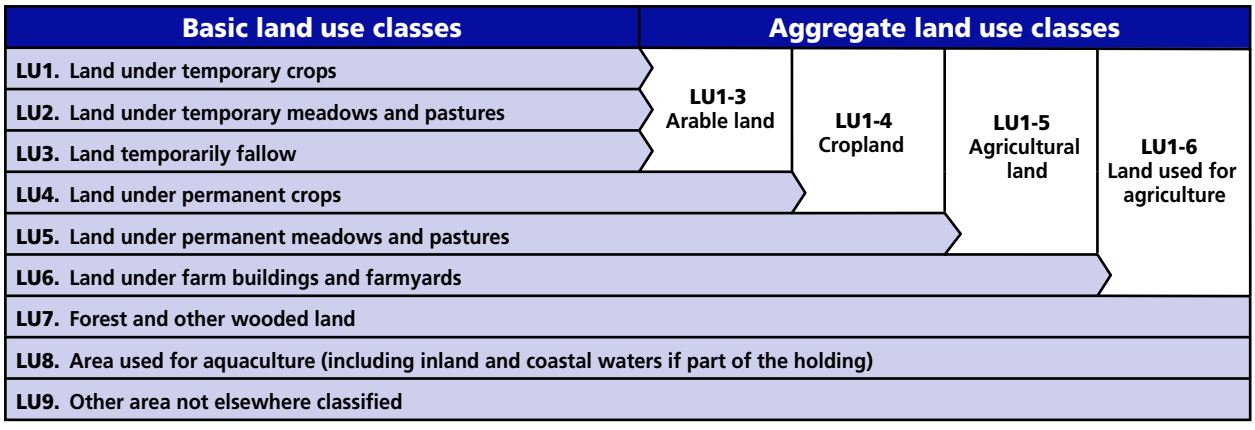
8.2.11 The SEEA Land Use Classification is designed for covering the whole territory of a country. Therefore not all of its classes are directly relevant for describing the area of an agricultural holding. For the purposes of the agricultural census, it is recommended that nine basic land use classes be identified:

- land under temporary crops;
- land under temporary meadows and pastures;
- land temporarily fallow;
- land under permanent crops;
- land under permanent meadows and pastures;
- land under farm buildings and farmyards;
- forest and other wooded land;
- area used for aquaculture (including inland and coastal waters if part of the holding);
- other area not elsewhere classified.

8.2.12 Definitions of these land use classes are given in paragraphs 8.2.18 - 8.2.35. The area of the holding is classified according to its main land use. See paragraph 8.2.17 for more information about main land use.

8.2.13 For presenting agricultural census results, the nine 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. Figure 1 shows the basic and aggregate land use classes recommended by WCA 2020. The relationship of the basic land use classes recommended by WCA 2020 to the relevant categories/classes of the SEEA land use classification is presented in Annex 8.

Figure 1 - Classification of land use (LU) for the agricultural census



8.2.14 The main differences from the 2010 programme are results of the harmonization efforts with the SEEA Land Use Classification. These are the following:

- Two categories: "land under farm buildings and farmyards" and "area used for aquaculture" have been detached from the category "other land". "Area used for aquaculture" may also include inland and coastal waters if they are part of the holding.
- The concept of "land used for agriculture" has been introduced in order to match the category "agriculture" of the SEEA Land Use Classification. It represents the total of "agricultural land" and "land under farm buildings and farmyards".
- A minimum size threshold of 0.5 hectares (ha) has been introduced for the "forest land" and "other wooded land" (see paragraphs 8.2.28-8.2.29).

8.2.15 A country may prefer to use its own land use classes and classification because they are well-established and meet national needs. In particular, a country may wish to further disaggregate the proposed basic land use classes in line with the SEEA Land Use Classification (see Annex 8). For instance: "Land under permanent meadows and pastures" can be further subdivided into cultivated and naturally grown; "Forest and other wooded land" can be subdivided into "Forest land" and "Other wooded land"; "Forest land" can be subdivided into naturally grown and planted. Countries using their own land use classes should ensure that the land use classes can be aggregated into the nine basic land use types. Land use data should also be presented according to the FAO recommendations to enable international comparisons to be made.

8.2.16 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 areas of temporary crops and fallow land are recorded accordingly. The areas under different land use classes should add up to the area of the parcel. Overall, the total area of the holding should be equal to the sum of the areas under all basic land use classes present on the holding.

8.2.17 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 8.4.15), 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. 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.

8.2.18 ***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 temporary crops. For example, strawberries, pineapples and bananas are considered to be annual crops in some areas. Such crops could be classified as temporary or permanent according to the custom in the country. Land under temporary crops includes also land used for growing temporary crops under protective cover.

8.2.19 Annex 4 provides the Indicative Crop Classification (ICC) which is recommended to be used by countries, including for identification of crop types, i.e. temporary or permanent crops. If a country uses a national breakdown of crops by temporary and permanent types that differs from the one recommended by ICC, the differences should be specified in the census report.

8.2.20 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 the net cropped area because of successive cropping (see paragraphs 8.4.10-8.4.11). 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 – namely, gross area and net area used in other FAO publications – the reader is encouraged to refer to paragraphs 35 and 58 of the publication Estimation of crop areas and yields in agricultural statistics (FAO, 1982).

8.2.21 ***Land under temporary meadows and pastures*** includes 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 and pastures. If country practice differs from this, the country definition should be clearly indicated in census reports.

8.2.22 ***Land temporarily fallow*** refers to 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.

8.2.23 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.

8.2.24 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 and 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.

8.2.25 ***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 and other wooded land"). Land under permanent crops also includes land used for growing permanent crops under protective cover. Land under permanent meadows and pastures is excluded from land under permanent crops. The ICC is provided in Annex 4, with the specification of permanent crops (see also paragraphs 8.2.18 – 8.2.19).

8.2.26 ***Land under permanent meadows and pastures*** includes land used permanently (for five years or more) to grow herbaceous forage crops, through cultivation or naturally (as wild prairie or grazing land). Whether ***land under permanent meadows and pastures*** is cultivated or naturally grown has important environmental implications; therefore countries are encouraged to further subdivide it according to this characteristic.

8.2.27 Land under farm buildings and farmyards refers to surfaces occupied by operating farm buildings (hangars, barns, cellars, silos), buildings for animal production (stables, cow sheds, sheep pens, poultry yards) and farmyards. Area under the holder's house (including the yard around it) is also classified here if it makes up part of the agricultural holding (see paragraph 8.2.5).

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

- ***Forest land*** is land spanning more than 0.5 ha with trees higher than 5 metres (m) and a canopy cover of more than 10 percent, or trees that are able to reach these thresholds in situ. It covers both natural and plantation forests. It includes forest roads, firebreaks and other small open areas, as well as areas that are temporarily not under trees (due to clear-cutting as part of forest management practice, abandoned shifting cultivation or natural disasters) but are expected to revert to forest within five years (in exceptional cases, local conditions may justify the use of a longer time frame). Windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 ha and width of more than 20 m are included. Forest tree nurseries that form an integral part of the forest should be included.
- ***Other wooded land*** is land spanning more than 0.5 ha[2] with: (i) trees higher than 5 m and a canopy cover of 5 10 percent, or trees able to reach these thresholds in situ; or (ii) trees not able to reach a height of 5 m in situ but with a canopy cover of more than 10 percent (e.g. some alpine tree vegetation types, arid zone mangroves, etc.); or (iii) combined cover of shrubs, bushes and trees of more than 10 percent.

2 This minimum threshold is introduced for harmonization with the definition of the "forest land" and "other wooded land" in the SEEA land use classification

8.2.29 Forest or other wooded land spanning less than 0.5 ha should be classified into "other area not elsewhere classified". Some countries, especially those with very small territory, such as small island countries, may wish to use a lower area threshold or no threshold at all in classifying the area as "forest land" or "other wooded land". When doing so, the country should clearly indicate this in the census report and provide separate tabulations for holdings with forest or wooded land above 0.5 ha to ensure international comparability.

8.2.30 A clear distinction must be made between "forest and other wooded land" and "land under permanent crops". Plantations of rubber or Christmas trees, as well as 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 should be handled according to national conditions and practices. The treatment of borderline cases should be clearly stated in the presentation of census results.

8.2.31 In agroforestry systems, land that is predominantly used for agricultural purposes (e.g. grazing in wooded areas and shrubby zones) is excluded from "forest and other wooded land" even if it satisfies the height and canopy cover criteria described above. However, some agroforestry systems, such as the "Taungya" system, where crops are grown only during the first years of forest rotation, should be classified as forest.

8.2.32 ***Area used for aquaculture*** includes area (land, inland waters or coastal waters) for aquaculture facilities, including supporting facilities. Aquaculture refers to farming of aquatic organisms such as fish, molluscs, crustaceans, plants, crocodiles, alligators and amphibians. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc.

8.2.33 According to national circumstances, countries may wish to further subdivide this class into three subclasses in line with the SEEA Land Use Classification (see Annex 8), specifically "land used for aquaculture", "inland waters used for aquaculture" and "coastal waters used for aquaculture". Definitions of these subclasses as well as more information on aquaculture are given in paragraphs 8.12.8 - 8.12.9 under Theme 12 Aquaculture.

8.2.34 ***Other area not elsewhere classified*** includes all other areas on the holding that are 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 a little more effort than that required for common cultivation practices. Also included under this category: land occupied by non-farm buildings; parks and ornamental gardens; roads or lanes (except forest roads, which are included in forest, see paragraph 8.2.28); open spaces needed for storing equipment and products; wasteland; land under water not used for aquaculture; and any other area not reported under previous classes (such as marshlands, wetlands, etc.).

8.2.35 FAO's recommended land use classification in the Figure 1 includes the following aggregate classes:

- ***Arable land*** is land that is used in most years for growing temporary crops. It includes land used for growing temporary crops during 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. Such land should be classified as "permanent meadows and pastures" if used for grazing or haying, "forest and other wooded land" if overgrown with trees and not used for grazing or haying, or "other area not elsewhere classified" if it becomes wasteland.
- ***Cropland*** is the total of arable land and land under permanent crops.
- ***Agricultural land*** is the total of cropland and permanent meadows and pastures.
- ***Land used for agriculture*** is the total of "agricultural land" and "land under farm buildings and farmyards".

0203 Area of holding according to land tenure types

- 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

Essential item. Reference period: census reference day

8.2.36 Item 0203 refers to breakdown of the total area of the holding according to specific land tenure types. A holding may have one or more tenure types corresponding to each land parcel (for parcel definition see paragraph 8.2.41). Land tenure refers to the arrangements or rights under which the holder operates the land making up the holding. As in the WCA 2010, 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.

8.2.37 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 in which 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.

8.2.38 ***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 in which 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 is outside the realm of the law.

8.2.39 ***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 8.2.48.

8.2.40 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.

0204 Location (for each parcel)

Reference period: census reference day

8.2.41 As mentioned in paragraph 6.15, 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 census reference day.

8.2.42 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, fences, waterways 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.

8.2.43 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 defined by where the farm buildings or agricultural machinery are located (see paragraph 8.1.2). 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 information on collecting location data, see paragraphs 8.1.2 - 8.1.4.

0205 Area (for each parcel)

Reference period: census reference day

8.2.44 This item is for those censuses that intend to collect data on holding area at the parcel level. For the definition of a parcel, see paragraphs 8.2.41 - 8.2.42. For information on how to determine the area of a holding, see paragraphs 8.2.1 - 8.2.6. Note that the sum of the parcel areas must be equal to the total area of the holding.

0206 Land use (for each parcel)

Reference period: census reference year

8.2.45 As mentioned in paragraph 8.2.16, land use data are often collected at the parcel level. This item serves this purpose. Land use classes, as recommended and defined in Item 0202, should be used. In conjunction with the parcel area, the information collected in this item can be used to estimate the area under different land use classes.

0207 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

Reference period: census reference day

8.2.46 Item 0203 "Area of holding according to land tenure types" has been recommended above as an essential item. However, countries may wish to collect land tenure data at a more detailed, parcel level. This item serves this purpose. It 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.

8.2.47 Note that a parcel must be of one tenure type (see paragraph 8.2.41). Refer to paragraphs 8.2.36–8.2.40 for definitions of land tenure and a description of the different land tenure types.

0208 Terms of rental (for each rented parcel)

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

Reference period: census reference day

8.2.48 This item relates to the conditions under which land is rented from others. It applies to parcels "rented from someone else" in Item 0207, and refers to the current rental arrangements (as of census reference day). Rental arrangements may take different forms.

- Land rented fo***r 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,*** either in kind or in equivalent amount of money, covers the situation in which 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 arrangements in which the holder is granted use of the land in return for services. Often, it is in lieu of wages, such as when 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 when 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.

0209 Use of shifting cultivation (for each parcel)

Reference period: census reference year

8.2.49 ***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 it. 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".

8.2.50 Data are collected on whether or not the parcel has been cultivated using shifting cultivation practices during the census reference year.

0210 Number of years since cleared (for each parcel)

Reference period: census reference day

8.2.51 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: (i) in the last year; (ii) 1 3 years ago; (iii) 4 or more years ago.

8.2.52 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 recorded.

0211 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)

Reference period: census reference day

8.2.53 ***Soil degradation*** refers to 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.

8.2.54 Three categories of soil degradation are given. ***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 matter, salination, acidification or pollution. ***Physical degradation*** refers to the ***physical deterioration*** of the soil, such as compaction, crusting and sealing, water-logging, and subsidence.

8.2.55 ***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***: productivity of the land on the holding is slightly reduced but restoration would be possible with modifications in the farm management system.
- ***Moderate***: 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.

8.2.56 The intention of Item 0211 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.

THEME 3: IRRIGATION

8.3.1 ***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.

8.3.2 Irrigation includes any process through 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 with 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.

8.3.3 Irrigation covers fully controlled irrigation and partially controlled irrigation. "Fully controlled" irrigation refers to surface, sprinkler and localized irrigation methods. "Partially controlled" irrigation refers to controlling flood waters to water crops (spate irrigation) or to equipped lowlands (including water control methods in wetland areas and inland valley bottoms, and flood recession cultivation). Items 0301, 0302, 0303, 0307 and 0309 are applicable to both fully and partially controlled irrigation; Items 0304, 0305, 0306 are relevant to fully controlled irrigation methods and Item 0308 to partially controlled irrigation methods.

8.3.4 Items 0301 to 0308 refer 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 period because of water shortages, lack of fuel, inability to pay water fees, no need for irrigation due to favourable weather conditions, etc. Irrigation refers to whether water was provided at least once during the census reference year, regardless of whether the quantity of water was sufficient. Item 0309 refers to area equipped for irrigation while item 0310 refers to the presence of drainage equipment on the holding.

0301 Use of irrigation on the holding: fully and partially controlled irrigation

Frame item. Reference period: census reference year

8.3.5 This item is recommended for inclusion in the core module when a modular approach is used, to provide a sampling frame for the census supplementary irrigation survey and for other irrigation surveys. The definition of irrigation is provided in paragraphs 8.3.1 to 8.3.3 and the item refers to both fully controlled irrigation and partially controlled irrigation methods. This item also helps to better understand cropping practices and the constraints on improving agricultural productivity

0302 Area of land actually irrigated: fully controlled and partially controlled irrigation

- Fully controlled irrigation
- Partially controlled irrigation

Essential item. Reference period: census reference year

8.3.6 See paragraphs 8.3.1-8.3.3 for the definition of ***irrigation***. This item includes areas actually irrigated by both fully controlled and partially controlled irrigation. Note that area irrigated in this item refers to the physical area of land irrigated, not the total area of crops irrigated. Therefore if the same area is cropped, irrigated and harvested twice a year, it should only be counted once. Item 0305 deals with the area of crops actually irrigated.

8.3.7 This item 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.

0303 Area of land actually irrigated according to land use type: fully controlled and partially controlled irrigation (for the holding)

- Land under permanent crops
- Land under temporary crops
  - Single-irrigated crop
  - Multiple-irrigated crops
- Land under temporary meadows and pastures
- Land under permanent meadows and pastures

Reference period: census reference year

8.3.8 See paragraphs 8.3.1 - 8.3.3 for the definition of irrigation and 8.3.6 for the definition of area irrigated. This item includes areas actually irrigated by both fully controlled and partially controlled irrigation. See paragraph 8.2.25 for the definition of "land under permanent crops", paragraph 8.2.18 for the definition of "land under temporary crops", paragraph 8.2.21 for the definition of "land under temporary meadows and pastures" and paragraph 8.2.26 for the definition of "land under permanent meadows and pastures". Crops grown under protective cover should be included under the respective category – either "land under temporary crops" or "land under permanent crops", as indicated in the definitions.

8.3.9 Note that area irrigated in this item refers to the physical area of land irrigated, not the total area of crops irrigated (see Item 0305). 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.

8.3.10 This item 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.

0304 Area of land actually irrigated according to method of irrigation: fully controlled irrigation (for the holding)

- Surface irrigation
- Sprinklers
- Localized irrigation

Reference period: census reference year

8.3.11 See paragraphs 8.3.8 - 8.3.9 for more information on land irrigated.

8.3.12 This item includes only areas of land irrigated by methods of fully controlled irrigation. Surface irrigation refers to a system for partially or completely covering land with water for the purpose of irrigation. There are various types of irrigation, including furrow, border-strip and basin irrigation. Basin irrigation includes submersion irrigation for rice. Manual irrigation using buckets or watering cans is also included. The use of water from water harvesting facilities, such as roof water harvesting, is included if the water supply is reliable. Surface irrigation does NOT refer to the method of transporting the water from the source up to the field, which may be done by gravity or by pumping.

8.3.13 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.

8.3.14 Localized irrigation is a system whereby 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.

0305 Area of crops actually irrigated for each crop type: fully controlled irrigation (for the holding)

Reference period: census reference year

8.3.15 This item includes only areas of land irrigated by methods of fully controlled irrigation. This item refers to the area of crops irrigated, as opposed to the area of land irrigated given in Items 0302, 0303 and 0304 (see paragraph 8.3.9). 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 0302 and 0.8 ha of crops irrigated in this item. Analysis of the crop area irrigated in relation to the land irrigated provides information on cropping intensity under irrigation.

8.3.16For temporary crops, this item refers to that portion of the harvested area (see paragraphs 8.4.5 - 8.4.17) irrigated at some time during the reference period. For permanent crops, this item refers to that portion of the area of permanent crops present on the day of enumeration (see paragraph 8.4.27) that was irrigated at some time during the reference period. See paragraphs 8.3.1 – 8.3.3 for the definition of irrigation.

0306 Sources of irrigation water: fully controlled irrigation (for the holding)

- Surface water
- Groundwater
- Mixed surface water and groundwater
- Municipal water supply
- Treated wastewater
- Other

Reference period: census reference year

8.3.17 This item includes only areas of land irrigated by methods of fully controlled irrigation. This item 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. See paragraphs 8.3.1 – 8.3.3 for the definition of irrigation.

8.3.18 The source of irrigation water refers to the categories provided above. ***Surface water*** is water found on the earth's surface that is naturally open to the atmosphere, in streams, rivers, ponds, lakes, wetlands or oceans. ***Groundwater*** is water stored underground in aquifers – that is, water in soil in the saturated zone beneath the water table, where the soil voids are filled with water. It is usually pumped from wells. ***Municipal water supply*** is a source of water accessible to at least two holdings. It refers to water withdrawn from the public piped distribution network. A fee is normally charged for access to this source. ***Treated wastewater*** is water with no further immediate value to the purpose for which it was used or produced because of its quality (i.e. wastewater), which has undergone wastewater treatment and is delivered to the user. For more information see AQUASTAT, FAO's Global Water Information System (2015).

8.3.19 Sometimes intermediary sources are used; in this case the most primary of the sources listed above should be selected. Thus, if a canal network is used to distribute water from a dam to farmers, the source of the water is surface water. If water is taken from a tap in the house or the village, the source is municipal water supply, etc. Countries may need to adapt or elaborate further the classes given to meet their needs.

1506 Rice cultivation - irrigation and water regimes

This refers to Theme 15: Environment/Greenhouse gas (GHG), item 1506

Reference period: census reference year

0307 Payment terms for irrigation water: fully and partially controlled irrigation (for the holding)

- Did not pay for water
- Paid for water
  - Fee based on area of land irrigated
  - Fee based on volume of water
  - Other

Reference period: census reference year

8.3.20 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. See paragraphs 8.3.1 - 8.3.3 for the definition of irrigation.

0308 Use of other types of irrigation: partially controlled irrigation (for the holding)

- Equipped wetland and inland valley bottoms
- Equipped flood recession cultivation
- Spate irrigation
- Other

Reference period: Data on partially controlled irrigation are normally collected for the census reference year, 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 and, if used, should be reported as such in the reports of results to permit proper interpretation.

8.3.21 This item refers to whether partially controlled irrigation methods were used on the holding. Partially controlled irrigation covers the specific methods listed above. A holding may have more than one type of partially controlled irrigation activity.

8.3.22 ***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, in which case this falls in the partially controlled irrigation category.

8.3.23 ***Flood recession*** refers to areas along the edges 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, in which case this falls in the partially controlled irrigation category.

8.3.24 ***Spate irrigation*** is a method of random irrigation using the floodwaters of a normally dry watercourse or riverbed (wadi). Spate irrigation is also referred to as floodwater harvesting. There are two types of spate irrigation. One is when 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 when 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. Spate irrigation falls under the partially controlled irrigation category.

0309 Area equipped for irrigation in working order: fully and partially controlled irrigation

Reference Period: census reference day

8.3.25 See paragraphs 8.3.1 - 8.3.3 for the definition of irrigation. This item refers to the existence of infrastructure and equipment for applying water to crops, which is in working order. Manual watering of plants using buckets, watering cans or other devices is not covered by this item.

8.3.26 Unlike Item 0302, which refers to the area actually irrigated, this item refers only to whether the holding is equipped for irrigation and the equipment is in good working order on the census reference day. The equipment does not have to be used during the reference year

8.3.27 The area equipped for irrigation covers areas equipped for fully controlled irrigation by any of the methods of surface, sprinkler or localized irrigation. It also includes areas under partially controlled irrigation methods of spate irrigation (controlling flood waters to water crops), equipped wetlands and inland valley bottoms and equipped flood recession.

0310 Presence of drainage equipment (for the holding)

Reference period: census reference day

8.3.28 For the purpose of the agricultural census, drainage means 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.

8.3.29 ***Presence of drainage equipment*** means that the equipment is present on the holding on the census reference day. 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 (Item 0308) is considered partially controlled irrigation, not drainage.

THEME 4: CROPS

0401 Types of temporary crops on the holding

Frame item. Reference period: census reference year

8.4.1 The information on temporary crops is limited to whether the holding grew each specific type of crop, as provided in Item 0401. This item is useful to provide a sampling frame for crop surveys. It is proposed that area data for temporary crops be collected as Item 0402.

8.4.2 Temporary crops are those with a less than one-year growing cycle (see paragraphs 8.2.18 - 8.2.19). A complete enumeration census provides a unique opportunity to collect information on all crops grown, including the minor crops. In a census conducted on sample enumeration basis, data on minor crops are likely to be less reliable and so only the major crops should be canvassed.

8.4.3 A crop classification is shown in Annex 4 to assist in collecting and tabulating crop data. An alphabetical list of crop names is also given in Annex 5. 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 as appropriate, 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), 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, animal feed, biofuels or other uses. Refer to Annex 4 for

more information on the principles underlying the crop classification and the problems in providing further detail.

8.4.4 Data on temporary crops are collected with respect to the census reference year 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 8.4.8 - 8.4.9). See paragraph 6.14 for more information on how to report crops where land is bought.

0402 Area of temporary crops harvested (for each temporary crop type)

Essential item. Reference period: census reference year

8.4.5 ***Temporary crops*** are crops with a less than one-year growing cycle (see paragraphs 8.2.18 - 8.2.19). For help in identifying crops, refer to the Indicative Crop Classification (ICC) in Annex 4 and to the alphabetical list of crops in Annex 5. See also paragraph 8.4.3.

8.4.6 ***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 percent of normal – 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.

8.4.7 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 8.4.47- 8.4.48). 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, for biofuels or for any other reason. Crops grown to maturity for harvesting specifically for the production of seed ("seed fields") should be included.

8.4.8 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 in cases 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.

8.4.9 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.

8.4.10 Temporary crops may be grown more than once on the same land in the same agricultural year. These crops are 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.

8.4.11 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.

8.4.12 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 area of 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.

8.4.13 The same applies to ***mixed crops,*** where more than one (often many) crop is 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.

8.4.14 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.

8.4.15 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 8.4.30 for more information.

8.4.16 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.

8.4.17 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.

0403 AREA OF TEMPORARY CROPS HARVESTED ACCORDING TO END USE (for each selected crop type)

Reference period: census reference year

8.4.18 Countries should collect data on end use 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
- Biofuels
- Other uses

8.4.19 The end use concept has been introduced to help assess food supplies and the production of fodder crops.

8.4.20 ***End use*** refers to the purpose of the crop. Crops may be grown for use as food for human consumption or as feed for animals, for producing biofuels 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, partly as a fodder crop and partly for producing biofuels. 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. Some other countries may be interested in crops used for producing biofuels. The major temporary crops used to obtain biofuels are maize, soybean, rapeseed, sunflower,

cassava, sugar cane and sweet sorghum; less used are wheat and sugar beet. For help in identifying crops, refer to the ICC in Annex 4 and the alphabetical list of crops in Annex 5. Other countries may wish to identify other uses of crops, such as for production of seeds ("seedfields"), as fibre for medicinal purposes, etc. The reference period should be consistent with Item 0402, usually the census reference year.

0404 Production of temporary crops harvested (for each selected crop type)

Reference period: census reference year

8.4.21 It is recommended that production for selected crops be collected. Countries should choose the crops according to their needs. Production data in an agricultural census are useful as benchmarks for current crop production statistics.

8.4.22 ***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).

0405 Types of permanent crops on the holding and whether in compact plantations

Frame item. Reference period: census reference day

8.4.23 This item on permanent crops refers to whether each specific type of crop is present on the holding, and which crops are grown in compact plantations. This item is useful for sampling frames for crop surveys. It is proposed that more detailed data on permanent crops be collected in Items 0406–0409. Some countries may wish to include more detailed data according to national needs.

8.4.24 ***Permanent crops*** are crops with a more than one-year growing cycle (see paragraph 8.2.25). 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 densely enough to be considered an orchard, are also considered a compact plantation.

8.4.25 Countries should refer to Annexes 4 and 5 for a list of crops. Countries should expand or abridge the crop list as appropriate, taking into account their circumstances and data needs (see paragraph 8.4.3).

0406 Area of productive and non-productive permanent crops in compact plantations (for each permanent crop type)

Essential item. Reference period: census reference day

8.4.26 ***Permanent crops*** are crops with a more than one-year growing cycle (see paragraph 8.2.25). For help in identifying crops, see Annexes 4 and 5. For the definition of a compact plantation, see paragraph 8.4.24.

8.4.27 ***Area of permanent crops*** refers to the area of the crop at a single point of time. Permanent crops should only be included if they are grown for the purpose of producing crops. This category does not include nurseries, where plant propagation materials are produced for sale or use on the holding (see paragraphs 8.4.47 - 8.4.48). In addition to area, some countries may also wish to collect data on the number of permanent crop trees in compact plantations.

8.4.28 ***Permanent crops of productive age*** refers 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.

8.4.29 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 8.4.12 - 8.4.14).

8.4.30 Special procedures are needed to measure areas where permanent crops are grown in a compact plantation in association with temporary crops (see also paragraph 8.4.15). 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 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 8.4.12 - 8.4.14). Often, the association of temporary and permanent crops is quite complex, with several permanent and temporary crops growing together in a single compact plantation. Countries will need to develop procedures suitable for national circumstances.

0407 Number of permanent crop trees in scattered plantings (for each tree crop)

Essential item. Reference period: census reference day

8.4.31 Item 0407 refers to the number of trees in scattered permanent crops for tree crops. Tree crops are defined as permanent crops in group 3, class 4.04 or class 9.04 of the crop classification (see Annex 4). Countries may wish to include other permanent crops, if suitable. Nurseries are excluded (see paragraphs 8.4.47–8.4.48).

8.4.32 For the definition of ***permanent crops,*** see paragraph 8.4.24. For help in identifying crops, see Annexes 4 and 5. ***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.

0408 Area of productive permanent crops in compact plantations according to end use (for each selected permanent crop type)

Reference period: census reference day

8.4.33 ***End use*** refers to the purpose of the crop (see paragraph 8.4.20). 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
- Biofuels
- Other uses

8.4.34 For the definition of ***permanent crops,*** see paragraph 8.4.24. For the definition of a ***compact plantation***, see paragraph 8.4.24. For information on ***area of permanent crops***, see paragraph 8.4.27. For the definition of ***permanent crops of productive age***, see paragraph 8.4.28. The major permanent crops used to obtain biofuels are oil palm and coconut. New permanent crops can be used for biofuels as technology evolves. For help in identifying crops, refer to the crop classification in Annex 4 and the alphabetical list of crops in Annex 5.

0409 Production of permanent crops (for each selected permanent crop type)

Reference period: census reference year

8.4.35 See paragraph 8.4.21 for information on production data in the agricultural census. ***Production*** refers to the actual quantity of produce, ready for sale or consumption (see paragraph 8.4.22).

0410 Area of land used to grow temporary crops as a secondary land use (for the holding)

Reference period: census reference year

8.4.36 Most temporary crops are grown on land classed as having "land under temporary crops" as its main use in the land use classification (see paragraph 8.2.18). 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.

8.4.37 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 8.4.15 and 8.4.30. Where a piece of land has a primary use, such as for aquaculture, which also enables it to be cropped for part of the year, the area cropped should be reported.

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

0411 use of each type of fertilizer (for the holding)

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

Essential item. Reference period: census reference year

8.4.39 For the purposes of the agricultural census, ***fertilizers*** refers to 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 K20). 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 types of fertilizer.

8.4.40 ***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".

8.4.41 ***Organo-mineral fertilizers*** are materials obtained through blending or processing organic materials with mineral fertilizers to enhance their nutrient content and fertilizing value. In this type of fertilizer the mineral nutrients are protected by the binding and absorption of the organic component, leading to a gradual release of nutrients in the soil and to a reduction of nutrient losses.

8.4.42 ***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 percent 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 compost and sewage sludge, contain less than the required nutrient content and should be considered "other organic materials to enhance plant growth".

8.4.43 ***Biofertilizers*** are products containing living or dormant micro-organisms, such as bacteria and fungi, which provide nutrients to enhance plant growth. The biofertilizers or microbial inoculants can be generally defined as preparations containing live or latent cells of efficient strains of nitrogen-fixing, phosphate-solubilizing or cellulolytic microorganisms. (FAO, 2008).

8.4.44 ***Manure*** is fertilizer prepared from organic material. Manures contribute to the fertility of the soil by adding organic matter and nutrients, such as nitrogen, that are trapped by bacteria in the soil. The manure (animal manure) has three main forms: solid/farmyard, liquid and slurry. Solid/farmyard manure is a mixture of solid excreta of domestic animals with or without litter used for their bedding, possibly including a small amount of urine. Liquid manure is urine from domestic animals, possibly including a small amount of excrement and/or water. Slurry is manure in liquid form, a mixture of liquid and solid animal excreta, with or without dilution with water and/or small amount of litter.

8.4.45 ***Other organic materials to enhance plant growth*** refers to any other plant, animal or unprocessed mineral materials other than fertilizers, that are applied to the soil to correct low nutrient content or any other problem. This includes green manure, compost and sewage sludge, lime, gypsum, sawdust, crop residue and synthetic soil conditioners. These materials may be of widely varying compositions. 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. Green manure/cover crops (GMCCs) are plants that are grown in order to provide soil cover and to improve the physical, chemical and biological characteristics of soil. GMCCs may be sown independently or in association with crops (FAO, 2011). Compost consists of organic materials of animal, plant or human origin partially decomposed through fermentation. Sewage sludge is residual organic material derived from sewage.

0412 Area fertilized for each type of fertilizer and major crop type (for the holding)

Reference period: census reference year

8.4.46 This item refers to the area of crops fertilized, according to the definition of fertilizers in Item 0411. 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 at 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.

0413 Presence of nurseries (for the holding)

Frame item. Reference period: census reference year

8.4.47 A ***nursery*** is an area where young plants, trees or vines are propagated for the purpose of transplanting. 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 seedfields (see paragraph 8.4.7).

8.4.48 This item refers to whether some area of holding was used as nursery during a twelve-month period, usually the census reference year.

0414 Area of nurseries (for the holding)

Reference period: census reference year

8.4.49 For a definition of nursery, please refer to paragraph 8.4.47. Plants in a nursery are not harvested and are therefore not included in the area harvested ("temporary crops" in Item 0402) or current area ("permanent crops" in Item 0406). 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.

0415 Presence of cropped land under protective cover (for the holding)

Frame item. Reference period: census reference year

8.4.50 ***Cropped land under protective cover*** is land under a permanent structure 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 under protective cover 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.

8.4.51 This item refers to whether some area of the holding was used for growing crops under protective cover during the census reference year.

0416 Area of cropped land under protective cover (for the holding)

Reference period: census reference year

8.4.52 For a definition of cropped land under protective cover, refer to paragraph 8.4.50. This item relates to area of land used for growing crops under protective cover during the census reference year. If a piece of land was used for growing different crops during census reference year, it will be counted only once.

THEME 5: LIVESTOCK

8.5.1 ***Livestock*** refers to all animals, birds and insects kept or reared in captivity mainly for agricultural purposes. This includes cattle, buffaloes, horses and other equine animals, camels, sheep, goats and pigs, as well as poultry, bees, silkworms, etc. – except aquatic animals (see Annex 6). Domestic animals, such as cats and dogs, are excluded unless they are being raised for food or other agricultural purposes. For further details on livestock please refer to the explanatory notes of Central Product Classification (CPC), Version 2.1.

8.5.2 This theme should cover all livestock as described in paragraph 8.5.1 that are being raised on the holding. Reference should be made to the list of livestock types given in Annex 6. Sometimes, a country may wish to subdivide an important livestock type by breed or raising method; for example, chickens may be split into local and imported breeds, or subdivided according to whether they are raised by "free-range" or commercial methods.

0501 Type of livestock system (for the holding)

- Grazing system
  - Nomadic or totally pastoral
  - Semi-nomadic, semi-pastoral or transhumant
  - Sedentary pastoral or ranching
- Mixed system
- Industrial system

Essential item. Reference period: census reference day

8.5.3 The ***livestock system*** refers to the general characteristics and practices of raising livestock on the holding. There are large variations in the scale and intensity of livestock systems (FAO, 2009) and it is difficult for a classification system to capture all of this diversity. For the purpose of the agricultural census the following livestock systems are identified:

- ***Grazing system*** is characterized by ruminants (e.g. cattle, sheep, goats and camels) grazing mainly on grasses and other herbaceous plants, often on communal or open-access areas and often in a mobile fashion. In this system more than 90 percent of the dry matter fed to animals comes from grazed grasses and other herbaceous plants. The following categories can be considered:
  - ***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 moves from place to place with the agricultural holder and his/her household, depending on the season and the availability of feed or water.
  - ***Semi-nomadic, semi-pastoral or transhumant*** 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. For semi-nomadic and semi-pastoral systems, the holder establishes a semi-permanent home for several months or years and may cultivate crops as a supplementary food source. Herds are moved on transhumance to assure forage and water.
  - ***Sedentary pastoral*** refers to livestock raised by holders who have a permanent residence. ***Ranching*** refers to large-scale livestock activities carried out on large areas of land set aside for extensive grazing, where livestock graze mainly on grasses and other herbaceous plants. In recent years, the numbers of nomadic and semi-nomadic holdings are declining and the majority of holdings within the grazing system are sedentary pastoral. Often, ranching is limited to a small number of holdings in the non-household sector (corporations or government holdings), which may be identified through Item 0103 "Legal status of agricultural holder (type of holder)".
- ***Mixed system*** describes the largest and the most heterogeneous livestock system, in which cropping and livestock-rearing are linked activities. It is defined as a system in which grazing may be largely practised but more than 10 percent of the dry matter fed to animals comes from crop or crop by-products or stubble; and less than 90 percent of the dry matter of the animal feed is off-farm produced.
- ***Industrial system*** refers to intensive livestock-raising methods in which (at least 90 percent of the dry matter) of the animal feed is off-farm produced. It often consists of a single species (beef cattle, pigs or poultry) fed in feedlots or other in-house systems of feeding.

8.5.4 In some cases it may be difficult to define directly the type of livestock system of the agricultural holding. In those cases several questions may be needed, such as questions about existence and period of animal grazing (see item 1501 "Type of animal grazing practices"), types of feed used (see item 0512 "Types of feed"), etc. to derive data for this item.

0502 Number of animals (for each livestock type)

Essential and frame item. Reference period: census reference day

8.5.5 The number of livestock is one of the essential items of the agricultural census, and is especially useful as a means of providing sampling frames for livestock surveys.

8.5.6 The ***number of animals*** is the animal population on the holding at a specific point in time, usually the census reference day. 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, except livestock belonging to another holding moved temporarily for sanitary or other reasons (sanitary cleaning, etc.). The latter should be reported by the other holding. Bees are counted on the basis of number of hives. If other units are used this must be specified in the reports and dissemination products.

8.5.7 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 animal, 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 with respect to some livestock, but working as an employee for other livestock. References to this distinction must be made in relation to item 0905 and item 1005 of Theme 9: Work on the holding and Theme 10: Intra-household distribution of managerial decisions and ownership on the holding, respectively.

0503 Number of female breeding animals (for each livestock type)

Essential item. Reference period: census reference day

8.5.8 ***Breeding animals*** refers to the number of female animals that are kept mainly for reproduction purposes rather than for food production.

0504 Number of animals: age and sex (for each livestock type)

Reference period: census reference day

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

- Cattle, buffaloes: calf (less than 1 year); young stock (1 year or more to less than 2 years); adult cattle/buffaloes (2 years or more).
- Sheep, goats: lamb/kid (less than 1 year); adult sheep/goat (1 year or more).
- Pigs: piglet (less than 3 months); young pig (3 months to 9 months), adult pig (over 9 months).
- Horses, camels, mules/hinnies, asses: foal (less than 1 year); yearling (1 year or more to less than 2 years); young stock (2 years or more to less than 4 years); adult stock (more than 4 years).
- Poultry: young birds (for example, aged less than three weeks); adult birds.
- Other animals: according to circumstances.

8.5.10 Countries often collect age and sex data only for the major livestock types. For some livestock types, it might be more convenient for countries to add physical characteristics (e.g. weight) when determining the age. 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.

0505 Number of animals according to purpose (for each livestock type)

Reference period: census reference day

8.5.11 ***Purpose*** refers to the main reason for the animals being kept. This is usually straightforward on commercial farms, as specific breeds of animal are used for certain purposes. The specific purposes recorded will depend on the type of livestock and local conditions. Normally, the following main purposes are identified. Countries may wish to develop further or combine some of the categories below:

- 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.

8.5.12 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 regarding purpose for the major livestock types only.

0506 Number of milking animals according to milk status (for each livestock type raised for milking)

- In milk
- Dry

Reference period: census reference day

8.5.13 This item relates to the livestock types raised for milking, as identified in Item 0505. 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.

0507 Number of animals born (for each livestock type)

0508 Number of animals acquired (for each livestock type)

0509 Number of animals slaughtered (for each livestock type)

0510 Number of animals disposed of (for each livestock type)

- Sold or otherwise disposed of for slaughter
- Other disposals

0511 Number of animals that have died from natural causes (for each livestock type)

Reference period for the five items above: For cattle, buffaloes and other large animals, normally the census reference year is 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.

8.5.14 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.

8.5.15 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 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.

8.5.16 ***Number of animals born*** refers to live 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 that are temporarily on the holding should not be included.

8.5.17 ***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.

8.5.18 ***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 0510. Slaughterings of other people's animals on the holding should not be included.

8.5.19 ***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 gifts, as 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 through sales to 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 0509. ***Other disposals*** covers sales and other disposals, such as gifts or as payment for services, that do not involve slaughterings.

8.5.20 ***Number of animals that have 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.

0512 Types of feed (for each livestock type)

- Forages/roughages
- Agro-industrial by-products/concentrate components, including crops
- Swill/household wastes
- Supplements/additives

Reference period: census reference year

8.5.21 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. For more information, see Gerber et al. (FAO, 2013). More than one type of feed may be used for a specific livestock type during the reference year. Countries may wish to distinguish between dry and wet seasons. In some countries, for example, animals may be grazed during the summer but need to be fed prepared feed during the winter. For information on animal grazing practices see Item 1501 "Type of animal grazing practices" (paragraphs 8.15.8 - 8.15-15).

8.5.22 ***Forages/roughages*** includes fresh grass or grass-legume mixture, grazed or cut and distributed; silage of grass or grass-legume mixture; hay (dry grass or grass-legume mixture); whole plant silage (maize, wheat, barley, oats, rye, etc.); crop residues (maize stover, crop straws, sugar-cane tops, banana leaves, etc.); tree leaves. ***Agro-industrial by-products/concentrate components (including crops)*** includes grain (corn, wheat, barley, oat, rye, sorghum, etc.); beans (including soybeans); corn gluten meal and feed; oilseeds; oilseed and cottonseed cakes; brans and middling; by-products from breweries and distillers' grains; molasses; fishmeal; cassava; banana fruit. Swill/household waste refers to organic household residues used as feed. ***Supplements/additives*** includes vitamins, amino acids and minerals.

0513 Use of veterinary services (for the holding)

- Number of visits by an extension officer /veterinarian
- Type of services received

Reference period: census reference year

8.5.23 ***Veterinary services*** covers all professional veterinary services used to protect animal health for the livestock kept on the holding. ***Type of services received*** includes curable treatment of diseases, surgical procedures, artificial insemination, breeding, vaccination, deworming, treatment against external parasites, general advice, etc. It includes services provided by government organizations, such as through veterinary field workers, as well as by the private sector.

8.5.24 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.

THEME 6: AGRICULTURAL PRACTICES

8.6.1 The section on agricultural practices has been extended to better cover some critical elements of sustainability in production systems. It covers only those items suitable for collection in the agriculture census and therefore does not provide a comprehensive set of items needed to measure sustainability of agricultural practices. The discussion below includes some items already discussed in other themes that

have been relisted to highlight their contribution to sustainable practices. These items will help to measure the adoption of and transition to improved agricultural practices and structural changes that increase and improve the provision of goods and services in agriculture in a sustainable manner. The data can also contribute to defining and measuring key indicators of resource use efficiency and resilience.

0601 Use of agricultural pesticides (for the holding)

- Insecticides
- Herbicides
- Fungicides
- Rodenticides
- Other

Essential item. Reference period: census reference year

8.6.2 ***Pesticides (sometimes called "agricultural chemicals")*** are materials intended to mitigate, control or eliminate pests in plants or animals, or to control the behaviour or physiology of pests or crops during production or storage. They are mostly synthetic chemicals produced in concentrated form, which are diluted for application with various substances such as water, talc, clays or kerosene. These can be categorized as shown above.

8.6.3 ***Insecticides*** are substances used to kill or repel insects. ***Herbicides*** are substances used to destroy or inhibit the growth of plants, such as weeds. ***Fungicides*** are substances that destroy or inhibit the growth of fungi. ***Rodenticides*** are substances that kill, repel or control rodents

0602 Use of genetically modified (gm) seeds (for the holding)

Frame item. Reference period: census reference year

8.6.4 Item 0602 relates to whether any GM seeds were used on the holding. ***Genetically Modified*** (GM) crops are grown from GM seeds, which are proprietary and developed by the private sector and which possess a novel combination of genetic material obtained through the use of modern biotechnology.

0603 Use of genetically modified (gm) seeds according to crop type (for the holding)

Reference period: census reference year

8.6.5 This item relates to what types of GM seeds were used on the holding. It identifies the specific types of crops that are grown using GM seeds.

0604 Selected machinery and equipment used on the holding by source (for the holding)

Reference period: census reference year

8.6.6 This item identifies machinery and equipment used on the holding, wholly or partly for agricultural production. 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.

8.6.7 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-powered 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 a 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 Annex 7, along with a list of some

of the major items under each heading. Countries may choose to further subdivide items – for example, by capacity.

8.6.8 ***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

0605 Non-residential buildings (for the holding)

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

- Owned
- Rented
- Other

Reference period: census reference year

8.6.9 This item identifies non-residential buildings used by the holding, wholly or partly for agricultural purposes. The item covers all non-residential buildings used by the holding regardless of their physical location, as buildings owned or rented are considered part of the holding. Use of buildings such as community storage facilities should be included under the tenure category "other". 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.

8.6.10 Identification in the category "For storing agricultural products (area or volume)" together with the detailed categories of Item 0107 "Main purpose of production of the holding" can be used to develop a frame of holdings for a more detailed survey of farm food stocks for sale. For instance, it would allow development of a frame of grain producers entering into the market – that is, holdings with storage facilities producing mainly for sale or mainly for own consumption with some sales, while identifying the capacity of the storage facility.

8.6.11 When intended for the purpose of creating a frame for a detailed stocks survey, the following more detailed categories are recommended for the category "For storing agricultural products (area or volume)" in order to identify the relevant types of storage facilities used by the holding :

- For grain crops (area or volume)
- For root crops (area or volume)
- For fruit and vegetable crops (area or volume)
- For livestock products (area or volume)
- For other agricultural products (area or volume)

0606 Percentage of each major agricultural product sold (for the holding)

Reference period: any suitable reference period, such as the main harvest or the census reference year

8.6.12 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 percent, 20-49 percent, 50 percent or more.

0607 Use of organic agricultural practices (for the holding)

Reference period: the day of enumeration

8.6.13 ***Organic agriculture*** "Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system." (FAO/WHO Codex Alimentarius Commission, 1999).

8.6.14 Organic agriculture comprises a set of practices. Some of the most recognized practices are aimed at enhancement of agro-ecosystem health, including biodiversity, biological cycles and soil biological activity. This includes working toward the achievement of socially, ecologically and economically sustainable agro-ecosystems, such as by not using chemical fertilizers or pesticides and not using GM crops.

8.6.15 In identifying the use of organic agricultural practices it should be noted that:

- The term organic agriculture refers to specific and precise standards of production which aim at achieving optimal agro-ecosystems that are socially, ecologically and economically sustainable.
- To be considered organic, the agricultural production processes must adhere to the "principles of organic practices". Although no unique standards have yet been defined for organic agriculture, two of the most widely used standards, developed at international level, are the CODEX Alimentarius and the standards developed by the International Federation of Organic Agricultural Movements (IFOAM).
- Countries may also have their own national standards; however, organic agriculture must be organic by intent and not by default. Thus, non-sustainable production systems that do not use synthetic inputs (for example, for reasons such as economic restriction) are not considered organic.

8.6.16 Data collection for this item should include:

Certified organic – this certifies that a farm is producing agricultural products which have been produced, stored, processed, handled and marketed in accordance with precise technical specifications (standards) and certified as "organic" by a certification body. Some bodies allow certification of part of a farm as long as organic and non-organic products are not mixed, while others require whole farm certification.

Certification can be through a third party accredited certification body or authority, or through Participatory Guarantee Systems (PGS). Third party certification bodies are accredited to a particular market (that is, the certification ensures that the production systems meet the regulations applying to a particular market) and being certified by a certification body enables producers to export products labelled as organic to that market (being certified does not allow access to all markets). PGS is based on active participation of stakeholders and only recognized within a country. It thus provides certification of organic production only for local markets, not for export.

Census items should identify whether the holding has been certified as an organic producer and, if so, whether for only local markets or for export markets. The particular export market the certification allows access to could be asked, if important to countries.

In-conversion to certified organic – this covers producers undergoing a conversion process to organic agricultural systems certified by third party certification bodies. Products can be marketed as in-conversion. The producer must have registered with the certification body and initiated conversion in accordance with the requirements of the certification body. There is usually a set time period for conversion, from initiation to completion of the process.

8.6.17 It is also possible to recognize non-certified (de facto) organic agriculture or products, which involve agricultural production systems that follow the principles of organic production but are not certified by a certification body or PGS. The designation excludes agriculture systems that do not use synthetic inputs by default (e.g. systems that lack soil building practices and degrade land).

8.6.18 It is recognized that identification of non-certified organic systems may be difficult to ascertain without detailed questioning regarding several agricultural production practices. There is also no single agreed standard by which practices should be followed. This category may therefore be difficult to collect and analyse, and it is not recommended for the census.

0608 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

Reference period: census reference year

8.6.19 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 8.6.23. The reference period is the census reference year.

8.6.20 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 an 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.

8.6.21 Uncertified seed refers to seeds that are 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.

8.6.22 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 traditional varieties are usually adaptive seed that is adapted for local conditions and stresses. These varieties are clearly identified by farmers.

0609 Source of seed inputs for each major crop type (for the holding)

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

Reference period: census reference year

8.6.23 This item refers how seeds were acquired. For the purpose of the agricultural census, the term "seeds" refers 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.

8.6.24 "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" refers to seeds obtained through loans, gifts or other forms of reciprocal assistance, including seed-for-seed exchanges between farmers. "Local market" refers to seeds purchased, either for cash or in exchange for other commodities, through markets, itinerant traders or localized trade networks. "Seed company" refers to seeds purchased from a seed producer or supplier through a commercial arrangement. "Donation" refers to seeds donated from national or international institutions.

1304 Whether agroforestry is practised (for the holding)

Frame item. Reference period: census reference year

8.6.25 This item is defined in Theme 13 Forestry: Item 1304. The presence of agroforestry on the holding constitutes a sustainable agriculture practice through its impact on soil, water, plant, animal and atmospheric relations.

0610 Types of tillage practices (for the holding)

- Conventional tillage
- Conservation tillage
- Zero tillage or no tillage

Reference period: census reference year

8.6.26 Tillage refers to arable land of the holding sown/cultivated in the census reference year (see Theme 2 Land, Figure 1, category LU1-3). It can be defined as any physical loosening of the soil carried out in a range of cultivation operations, either by hand or mechanized. Tillage practices are controversially debated among agricultural scientist and practitioners. While traditionally tillage was seen to be a useful and necessary agriculture practice, inappropriate tillage practices are also identified as one of the major reasons for soil erosion and land degradation. There is a common understanding that tillage practices should be reduced to a minimum in order to achieve sustainable intensification of agriculture.

8.6.27 Tillage practices can be placed on a continuum of soil cover retained and reduced tillage effort, with the most sustainable practices defined as conservation agriculture (item 0611). For the purposes of the agriculture census, the following groupings are identified to reflect this continuum.

8.6.28 ***Conventional tillage*** involves inversion (turning over) of the soil over the whole area with tillage operations including inversion tillage/ploughing using tillage tools or equipment, such as a mouldboard or disc plough or powered tillage equipment, such as a rotovator. In other cases, traditional ploughs, of either wood or iron, drawn by animal power may be used.

8.6.29 ***Conservation (low) tillage*** involves tillage practice or practices that leave plant residues (at least 30-35 percent) on the soil surface for erosion control and moisture conservation. Soil should normally not be inverted but only ripped.

8.6.30 Conservation tillage can include the following systems and the item definition should refer to those which are present in the country:

- ***Reduced tillage / minimum tillage*** – The arable land is prepared with equipment which does not invert the soil and which causes little compaction but which leaves some ripping lines. For this reason, the soil normally remains with a good cover of residues on the surface. Reduced tillage is usually carried out with specialized tined implement, such as a ripper.

- ***Strip tillage*** – In this case strips are tilled to receive the seed, while the soil along the intervening bands is not disturbed and remains covered with residues such as mulch.
- ***Ridge tillage*** – This is a system of ridges and furrows. The ridges may be narrow or wide and the furrows can be parallel to the contour lines or constructed with a slight slope, depending on whether the objective is to conserve moisture or to drain excess moisture. The surface is prepared by scraping off the top of a ridge, with the crops planted into the tops of the ridges formed during cultivation of the previous crop. The soil is covered with residue between the rows until planting. The ridges can be semi-permanent or be constructed each year, which will govern the amount of residue material that remains on the surface.

8.6.31 ***Zero tillage or no tillage*** does not involve any tillage operations on arable land. After the seeding operation, not more than 25 percent of the soil surface is allowed to be disturbed. The soils are always covered, including for the period between harvest and sowing. The stubble is retained and the soil surface is covered by residue mulch or stubble for erosion control.

8.6.32 Seeding/planting is done with special no-tillage/direct seeders, which are able to open a narrow slot of the soil (through soil cover), drop the seed and close the slot again. Zero tillage is carried out with implements such as direct planters or hand-jab planters. Seed can be also sown by broad casting into standing vegetation or into small holes in the ground intended for seed placement.

0611 Presence of conservation agriculture (for the holding)

Reference period: census reference year

8.6.33 In addition to sustainable tillage practices, it is also important to keep soils covered in order to protect them from the impacts of sun, wind and heavy rainfall in order to achieve sustainable intensification of agriculture. Conservation Agriculture aims to achieve this by applying the three Conservation Agriculture principles of zero/no tillage (Item 0610) carried out in combination with useful crop rotations (Item 0612) and permanent soil cover, where the soil is always covered, including for the period between harvest and sowing. FAO has defined this combination of use of crop rotations, zero or no tillage, and the presence of permanent soil cover as Conservation Agriculture. In a Conservation Agriculture system all these components are combined and applied at the same time on the holding and to the same parcel. Countries wishing to ask about the presence of conservation agriculture should refer to these three practices.

0612 Presence of soil conservation practices (for the holding)

- Crop rotation
- Terraces or other means to control erosion on slopes

Reference period: census reference year

8.6.34 Soil conservation is a sustainable practice to prevent and reverse the degradation of soil through appropriate land use and management practices. It is defined as activities to maintain or enhance the productive capacity of the land in areas affected by or prone to degradation, including prevention and reduction of soil erosion, compaction and salinity, conservation or drainage of soil water, and maintenance or improvement of soil fertility. Where feasible, information on the percentage of land area under each type of soil conservation practice should be asked. Other activities related to crop cover apply to soil conservation but are not recommended for collection during the census.

8.6.35 ***Terracing*** – Terracing is found on sloping lands and is mainly used for erosion control and for growing crops on sloping lands. Terracing is generally continuous. Bench terraces are a series of level or virtually level strips running across the slope at vertical intervals, supported by steep banks or risers. Discontinuous terracing can be of several forms, including: hillside ditches, which are discontinuous types of narrow bench terraces built across the hill slopes; orchard terraces which are narrow bench terraces built across slopes where fruit trees or food trees are planted; or convertible terraces which are bench terraces that alternate with the original slope and are used for the mixed cultivation of annual and tree crops.

8.6.36 ***Crop Rotation*** – Crop rotation is the growing of alternating species or families of crops in a specific field in a planned pattern or sequence so as to break weed, pest and disease cycles and to maintain or improve soil fertility and organic matter content.

1501 Type of animal grazing practices (for the holding)

8.6.37 This item is covered in Theme 15: Environment/Greenhouse gas (GHG) emissions, Item 1501.

0411 Use of each type of fertilizer (for the holding)

Essential item. Reference period: census reference year

8.6.38 This item is covered in Theme 4: Crops. Use of fertilizers and whether organic or inorganic practices are followed is important for sustainable agriculture practices.

0412 Area fertilized for each type of fertilizer and major crop type (for the holding)

8.6.39 This item is covered in Theme 4: Crops. Use of fertilizers and whether organic or inorganic practices are followed is important for sustainable agriculture practices.

Theme 3: irrigation

8.6.40 Irrigation practices are important for understanding of sustainable agriculture practices. Relevant items are covered under Theme 3: Irrigation.

THEME 7: SERVICES FOR AGRICULTURE

0701 Receipt of credit for agricultural purposes (for the holding)

Reference period: census reference year

0702 Source of credit (for the holding)

Reference period: census reference year

0703 Type of collateral for credit (for the holding)

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

Reference period: census reference year

0704 Period of loan or credit (for the holding)

8.7.1 Credit for agricultural purposes refers to any type of credit approved and available 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.

8.7.2 Receipt of credit refers to whether the agricultural holder used a loan for agricultural purposes during the reference year, not whether there were outstanding loans 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.

8.7.3 The term "credit" is used widely to cover the approved ability to borrow 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. Loan is a subset of credit and means financial resources in cash provided by formal or informal sources. Credit also includes, in addition to loans in cash, any loan that is provided in-kind in the form of inputs, equipment or machinery, for example.

8.7.4 Item 0702, ***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

8.7.5 In Item 0703, ***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 a 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.

8.7.6 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.

8.7.7 ***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 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

0705 Sources of agricultural information (for the holding)

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

Reference period: census reference year

8.7.8 ***Sources of agricultural information*** refers 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.

8.7.9 Most farmers use various sources of information. Usually, countries prefer to collect data on all the sources. ***Extension services*** refers to advice received through government or non-government extension services, and is covered in more detail in Item 0706.

0706 Sources of agricultural extension services used (for the holding)

Reference period: census reference year

8.7.10 ***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 grassroots 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.

8.7.11 In most countries, the 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 general extension officers providing advice in all disciplines. In other countries, there are specialized extension services in crops, livestock and perhaps other fields.

8.7.12 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 may be 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.

8.7.13 Item 0706 refers to the source or provider of agricultural extension services used by the holding during the census reference year. It refers to personal contact with extension personnel (including telephone service with user access to a live extension agent) or direct participation in extension activities such as a farm demonstration. It does not include accessing extension material though printed brochures, radio, television, menu-driven recorded telephone messages and services, or the Internet. Also, extension services used 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.

8.7.14 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
  - For crop production
  - For livestock production
- Farmer association
- Other

0707 Travelling time to nearest periodic or permanent agricultural produce market for selling products (for the holding)

Reference period: census reference year

8.7.15 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:

- Up to 30 minutes
- More than 30-60 minutes
- More than 60-120 minutes
- More than 2 hours

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

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

THEME 8: DEMOGRAPHIC AND SOCIAL CHARACTERISTICS

0801 Household size by sex and age groups

Essential item. The reference period: According to the de jure concept, the data on household size relate to persons who, at the time of the census, are usually resident in the household.

8.8.1 Household size by sex and age groups refers to the number of members of the holder's household, classified by sex and age groups. This information can be obtained either by listing all household members, asking each of them about their sex and age and aggregating the information by sex and age groups, or asking a direct question on the number of household members and their distribution by sex and age groups. The disaggregation of data by sex is a fundamental requirement for gender statistics. The age groups could be determined according to national circumstances. However, while deciding the age group categories of the household members, the countries should be able to differentiate between the child, adult of working age and older person categories. This is important for determining the dependency ratio (the ratio of those that are not gainfully employed to those that are gainfully employed within the household) and for poverty analysis. A household is one or more persons living together who make common provision for food or other essentials for living (see paragraph 6.5).

8.8.2 It is recommended that household data only be collected for those agricultural holdings in the household sector which are operated by households with a single holding. It would be difficult to interpret household data for other types of holdings and could lead to duplicate counting of household members. Household data are not normally provided for other types of holdings in the household sector in Item 0103; some countries collect household data for "multiple-holding households" by referring to the group of persons within the household operating the holding.

8.8.3 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 but return home regularly. The treatment of such cases should be clearly stipulated (see UN, 2015b, paragraph 4.128).

0802 Sex (for each household member)

- Male
- Female

Reference period: census reference day

0803 Age (for each household member)

Reference period: census reference day

8.8.4 ***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 data are sometimes difficult to collect. In some countries, people have different ways of calculating age, such as age at 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.

0804 Relationship to household head or other reference person (for each household member)

Reference period: census reference day

8.8.5 ***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 sex – 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.

8.8.6 The relationship categories should be based on international standards used in the population census programme (UN, 2015b, paragraph 4.136), to ensure 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
- Partner in consensual union (cohabiting partner), where applicable
- Child
- Spouse of child
- Grandchild or great grandchild
- Parent or parent of spouse
- Other relative
- Other unrelated person

8.8.7 Households should be divided into household composition types based on the family nucleus. The following groupings used in the population census (UN, 2015b, paragraph 4.146) are usually suitable:

- One-person household
- Nuclear household
  - Married couple family with child(ren)
  - Married couple family without child(ren)
  - Partner in consensual union (cohabiting partner) with child(ren)
  - Partner in consensual union (cohabiting partner) without child(ren)
  - Father with children
  - Mother with children
- Extended household
- Composite household

0805 Marital status (for each household member)

Reference period: census reference day

8.8.8 ***Marital status*** refers to 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, 2015b, paragraph 4.164), to ensure consistency with other national statistics. The following groupings are recommended:

- Never married
- Married
- Married but separated
- Partner in consensual union (cohabiting partner), where applicable
- Widowed and not remarried
- Divorced and not remarried

8.8.9 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.

8.8.10 Data on marital status are sometimes collected for all persons, regardless of age, but often the category 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.

0806 Educational attainment (for each household member)

Reference period: census reference day

8.8.11 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 include 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.

8.8.12 Data on educational attainment should 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 2011). 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 subdivided to meet national needs.

0807 Agricultural training/ education of holder

Reference period: census reference day

8.8.13 This item aims at collecting information on training/education received by the holder for a specific field or task in agriculture. These data can be obtained by asking the holder about their agricultural education/training.

8.8.14 Data on agricultural training/education of the holder should be recorded in suitable categories according to national circumstances. Attention should be paid to consistency of those categories with the categories recommended by International ISCED (UNESCO 2011). Countries may wish to consider the following categories, which correspond to the ISCED 2011 classification. Definitions of each category can be found in ISCED 2011:

- ***Informal learning in agriculture*** – refers to practical agricultural training/education, i.e. experience acquired through practical work (field tours, etc);
- ***Non-formal education in agriculture*** – refers to short-term, ad hoc courses in agriculture, completed at or provided by a government institution, international organization or any specialized institution in agriculture;
- ***Secondary education in agriculture*** – refers to any education in agriculture completed at the secondary education level;
- ***Tertiary education in agriculture*** – refers to high level education training, acquired at the tertiary education level.

THEME 9: WORK ON THE HOLDING

Reference concepts of work and forms of work in labour statistics

8.9.1 The current theme corresponds to the theme "Farm labour" from WCA 2010 and covers items related to the two types of work inputs on the agricultural holding: (i) work provided by household members; and (ii) work provided by outside workers.

8.9.2 Data collection on work on the holding in the agricultural census should be in line with recommendations provided in the Resolution concerning statistics of work, employment and labour underutilization (ILO, 2013) adopted by the 19th ICLS in 2013 (below referred to as the Resolution). The Resolution establishes a new framework for work statistics, which uses short reference periods (such as one week or a month) for the operational definitions of the forms of work concepts. However, for the agricultural census a longer observation period, such as a year, is more appropriate because of the seasonal nature of many agricultural activities.

8.9.3 The Resolution defines the basic concept of work as comprising "any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use". For this reason the title of this theme has been changed to "Work on the holding".

8.9.4 Work is defined irrespective of its formal or informal character or of the legality of the activity. It excludes activities that do not involve producing goods or services (e.g. begging and stealing), self-care (e.g. personal grooming and hygiene) and activities that cannot be performed by another person on one's own behalf (e.g. sleeping, learning and activities for own recreation). According to the Resolution, the concept of work covers all activities within the general production boundary as defined in the SNA 2008.

8.9.5 Work, as defined in the Resolution, can be performed in any type of economic unit as distinguished by the SNA 2008, namely: (i) market units (i.e. corporations, quasi-corporations and household unincorporated market enterprises, the latter encompassing, as a subset, informal sector units); (ii) non-market units (i.e. government and non-profit institutions serving households); and (iii) households that produce goods or services for own final use.

8.9.6. The Resolution identifies five mutually exclusive subsets of work activities or ***forms of work***, distinguishing them on the basis of the intended destination of the production (for own final use or for use by others, i.e. other economic units) and the nature of the transaction (i.e. monetary or non-monetary transactions and transfers). These forms are:

- ***own-use production work***, comprising production of goods and services for own final use (an unpaid form of work);
- ***employment work***, comprising work performed for others in exchange for pay or profit;
- unpaid trainee work, comprising work performed for others without pay to acquire workplace experience or skills;
- ***volunteer work***, comprising non-compulsory work performed for others without pay;

- ***other work*** activities (including such activities as unpaid community service and unpaid work by prisoners, when ordered by a court or similar authority, and unpaid military or alternative civilian service).

8.9.7 Own-use production of goods, employment, unpaid trainee work, a part of volunteer work and "other work activities" are within the SNA 2008 production boundary, while own-use production of services and the remaining part of volunteer work are outside the SNA production boundary but inside the SNA general production boundary. Figure 2 presents the conceptual framework for work statistics, delineating the forms of work categories within the SNA 2008 production boundary, which are relevant to the scope of this theme, and thus should be covered, depending on the national context and information needs of countries.

Figure 2 - Conceptual framework for work statistic

<table>
<tr><td>Intended destination of production</td><td colspan="2">For own final use</td><td colspan="5">For use by others</td></tr>
<tr><td rowspan="2">Forms of work</td><td colspan="2">OWN-USE PRODUCTION WORK</td><td rowspan="2">EMPLOYMENT (WORK FOR PAY OR PROFIT)</td><td rowspan="2">UNPAID TRAINEE WORK</td><td rowspan="2">OTHER WORK ACTIVITIES</td><td colspan="3">VOLUNTEER WORK</td></tr>
<tr><td>of services</td><td>of goods</td><td>in market and non- market units</td><td>in households producing goods</td><td>services</td></tr>
<tr><td>Relation to SNA 2008</td><td colspan="7">Activities within the SNA production boundary *
Activities inside the SNA general production boundary</td></tr>
</table>

*The scope of the present theme corresponds to forms of work categories within SNA production boundary.

8.9.8 Different statistical and analytical units are relevant for the production of statistics on each form of work, including persons, jobs or work activities and time units. ***Persons*** are the basic unit for producing statistics on the population engaged in each form of work. A ***job*** or ***work activity*** is defined as "a set of tasks and duties performed, or meant to be performed, by one person for a single economic unit". The term "job" is used in relation to employment while the term "work activity" is used in relation to other forms of work. In cases of multiple job-holding, the ***main job*** is the job with the longest hours usually worked, as defined in the 1 ICLS Resolution concerning the measurement of working time (ILO, 2009). Time units are used for producing statistics regarding volume of work. ***These units*** may be short, such as minutes or hours, or long, such as days, weeks or months. ***Hours usually worked*** is defined as the typical (e.g. modal) value of the hours actually worked in a job for a short reference period (e.g. week) over a long observation period (month, quarter, season, year), and includes overtime hours regularly worked, whether paid or unpaid.

8.9.9 The theme collects information about the ***working age population***. To determine the working age population, the Resolution recommends that: (i) "the lower age limit should be set taking into consideration the minimum age for employment and exceptions specified in national laws or regulations, or the age of completion of compulsory schooling"; and (ii) "no upper age limit should be set, so as to permit comprehensive coverage of work activities of the adult population and to examine transitions between employment and retirement". A minimum age limit lower than that used to define the working-age population may be appropriate in countries where children often participate in agricultural work. To facilitate international comparisons, tabulations should distinguish between persons aged less than 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 less than ten years.

Operational definitions on relevant forms of work

8.9.10 One of the main new features of the new work statistics framework that is particularly relevant to the agricultural sector is the distinct treatment of persons in employment and persons in own-use production work (e.g. of agricultural goods).

8.9.11 ***Persons in employment*** are defined as all those of working age who, during a short reference period (that is, seven days or one week), were engaged in any activity to produce goods or provide services for pay or profit. They comprise employed persons "at work", i.e. who worked in a job for at least one hour, as well as employed persons "not at work" due to temporary absence from a job or to working-time arrangements (such as shift work, flexitime and compensatory leave for overtime). "For pay or profit" refers to work done as part of a transaction in exchange for remuneration payable in the form of wages or salaries for time worked or work done, or in the form of profits derived from the goods and services produced through market transactions. For pay or profit includes remuneration in cash or in kind. Included in employment are persons who work in their own economic units to produce goods intended mainly for sale or barter, even if part of the output is consumed by the household or family, as well as household or family members of such persons that work in those market-oriented units. Employment also includes persons with seasonal jobs during the off-season, if they continue to perform some tasks and duties of the job; such employment may be of particular relevance for this theme.

8.9.12 This definition has important implications for defining employment for the purposes of Theme 9. For agricultural holdings in the household sector, the working-age members of the holder's household that have worked on the holding will be considered as being in employment only if the holding's intended destination of production during the census reference year has been mostly for sale or barter and the person meets a minimum threshold number of hours worked, defined by countries according to national circumstances.

8.9.13 ***Persons in own-use production work of goods*** (an unpaid form of work that was previously covered under employment in the WCA 2010), are defined in the Resolution as all those of working age who, during a short reference period (that is, four weeks or one calendar month) performed any activity to produce goods for own final use for a cumulative total of at least one hour. For the purpose of this theme, the working-age members of the agricultural holding's household that have worked on the holding will be considered as being in own-use production work if the holding's intended destination of production during the census reference year has been primarily for own use and the person meets a minimum threshold number of hours worked, defined by countries according to national circumstances.

8.9.14 The Resolution indicates that "for own final use" is interpreted as production for which the intended destination of the output is mainly for final use by the producer in the form of capital formation or final consumption by household members, or by family members living in other households. In the case of agricultural goods production, while the intended destination of the products produced is for own use, some portion may nonetheless be sold or bartered.

Operational definitions related to labour force status

8.9.15 The ***labour force status*** of a person of working age may be in one of three mutually exclusive categories, namely: in employment, in unemployment or outside the labour force. In defining labour force status, priority is given to (i) employment, followed by the categories of (ii) unemployment and (iii) outside the labour force. The sum of persons in employment and in unemployment equals the labour force.

8.9.16 ***Persons in employment*** are defined in 8.9.11 above. ***Persons in unemployment*** are defined as all those of working age who: (i) were not in employment; (ii) carried out activities to seek employment during a specified recent period; and (iii) were currently available to take up employment given a job opportunity. ***Persons outside the labour force*** are those of working age who were neither in employment nor in unemployment during the reference period.

8.9.17 For more details regarding concepts and operational definitions related to forms of work and labour force status, the reader is referred to the Resolution.

Use of the agricultural census reference year and questionnaire design issues

8.9.18 The new work statistics framework uses short reference periods (such as one week or one month) for the operational definitions of the forms of work concepts. However, for the agricultural census, a longer observation period, such as a year, is more appropriate to capture work inputs into agricultural production throughout the year, taking into account the seasonal nature of many agricultural activities. For all items in the present theme, the reference period is ***the census reference year***. For the purposes of this theme, some concepts are adapted to suit the long reference period (see definition of "main activity" in Item 0901, definition of "labour force status" over the year in Item 0904, and definition of "main job" in Item 0905). Thus, the agricultural census data complements work statistics based on national labour force surveys, which provide data using a short reference period, or in the absence of such surveys, fills important gaps in the national statistics of work.

8.9.19 As for items in the agricultural census, countries need to carefully design questionnaires for the collection of data related to work on the holding, suitable to national circumstances. Labour force status data can only be collected by asking persons in the working-age population a series of specific questions to determine whether or not they should be classified as in employment and, if not, about possible steps taken to find employment and their current availability to start a job. Accurately measuring activities over a twelve-month reference period is difficult and special data collection measures are needed to ensure that reporting is as complete and accurate as possible. Efforts must be made to ensure that data are not biased as a result of misclassification of the labour force status of the working age population, especially among women and family members contributing to work on the holding.

8.9.20 As noted in paragraph 8.9.7, only work activities which are within the SNA production boundary are covered in the items of the present theme.

Items

0901 Whether working on the holding is the main activity (for each household member of working age, identifying the sex)

Essential item. Reference period: census reference year

8.9.21 The purpose of this item is to determine whether or not, during the census reference year, the household member spent more time working on the agricultural holding than outside the holding (considering activities within the SNA production boundary).

0902 Working time on the holding (for each household member of working age, identifying the sex)

Essential item. Reference period: census reference year

8.9.22 This item is intended to collect information on the volume of work contributed by household members to the operation of the holding, both in paid and unpaid forms of work, as relevant to national circumstances, as well as obtaining data on the number of household members working on the holding, disaggregated by sex.

8.9.23 To measure the volume of work, the WCA 2020 recommends the same approach as in WCA 2010, using measurement of working time as recommended by 1 ICLS Resolution (ILO, 2009). As defined in that resolution, working time "comprises the time associated with productive activities and the arrangement of this time during a specified reference period". For the purposes of this item, ***working time*** covers the time spent by household members in jobs and work activities on the agricultural holding during the twelve-month reference period.

8.9.24 The measurement of working time can be done based on the assessment of hours or days worked on the holding, or by using broad categories such as full-year/part-year or full-time/part-time, as feasible and relevant to national circumstances. ***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 a norm such as an eight-hour day or a 40-hour week.

8.9.25 Countries should give careful consideration to the measurement of working time, taking into account national circumstances and the way in which data are to be presented in census tabulations. Based on a broad categories approach, one option is to present data according to specified weeks/months per year and hours per day/week groupings. Another option is to summarize working time according to the following six categories:

- Full-time work during 1-3 months in the year;
- Full-time work during 4-6 months in the year;
- Full-time work during 7 or more months in the year;
- Part-time work during 1-3 months in the year;
- Part -time work during 4-6 months in the year;
- Part -time work during 7 or more months in the year.

8.9.26 As relevant to national circumstances, it is recommended that the ***number of persons who worked on the holding*** during the census reference year (i.e. the number of household members of working age who worked on the holding in paid or unpaid work), as well as working time of such persons, be cross-tabulated according to whether the work is in employment or in own-use production work and also by sex. A person who worked on the holding with break(s) during the census reference year should be counted only once – that is, according to a proxy measurement of his/her main form of work. Countries are recommended to present census results on item 0902 with respect to the main form of work (employment or own-use production work), a derived variable based on the intended destination of the output of the holding (that is, for sale/barter or for own final use) and a suitable threshold of working time over the long reference period. Thus, the number of household members of working age who have been engaged in work on the holding (item 0902) during the census reference year will constitute a proxy measure of:

a) ***Number of persons working on holdings where the main intended destination of production is for sale or barter (proxy for employment)*** if the holding's intended destination of production during the census reference year has been primarily for sale or barter and the person was engaged in a job(s) on the holding for at least a minimum threshold number of hours; the threshold is to be defined according to national circumstances.
b) ***Number of persons working on holdings where the main intended destination of production is own final use (proxy for own-use production work)*** if the holding's intended destination of production during the census reference year has been for own final use and they were engaged in work activity (activities) on the holding for at least a minimum threshold number of hours; the threshold is to be defined according to national circumstances.

0903 Number and working time of employees on the holding by sex (for the holding)

- Male employees
- Female employees

Essential item. Reference period: census reference year

8.9.27 Items 0901-0902 refer to the work that household members supply to the holding. The current item, Item 0903, refers to the use of paid workers on the holding. For holdings in the non-household sector it refers to all employees on the holding, while in the household sector it refers only to employees who are not members of the holding's household.

8.9.28 An e***mployee 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 8.9.38). This

includes regular employees, as well as seasonal, short-term 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 agricultural holding are excluded. Household members are excluded from Item 0903 because their work inputs to the holding are covered under Item 0902. A hired manager (see paragraph 8.1.29) is considered part of the employees on the holding.

8.9.29 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 0903 covers only employees. Contract work is covered in Item 0907. For more information on the difference between employees and contractors, see paragraph 8.9.49.

8.9.30 The number of employees on the holding refers to a count of the number of persons who were classified as employees 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.

8.9.31 Working time data for employees should be consistent with the similar data for household members (see paragraphs 8.9.22 - 8.9.25). In this regard, the working time groupings/categories considered in paragraph 8.9.25 should be suitable. Employees can be grouped together according to a short or long duration of their implicit or explicit contracts (e.g. regular employees, seasonal, short-term and casual workers).

8.9.32 As for all working time data, care is needed in designing suitable questionnaires and data collection procedures (see paragraph 8.9.19).

0904 Labour force status (for each household member of working age, identifying the sex)

- Within the labour force
  - In employment
  - n unemployment
- Outside the labour force

Reference period: census reference year

8.9.33 ***Labour force status*** refers to whether a person's main status was within or outside the labour force during the census reference year (see paragraph 8.9.15).

8.9.34 For the purposes of this item, a person within the labour force is a person whose main status was either in employment or in unemployment according to the definitions in paragraphs 8.9.11 and 8.9.16 during the census reference year; otherwise the person is considered to be outside the labour force. A person within the labour force is considered to be mainly in employment if his/her time in employment is equal to or greater than the time during which he/she was in unemployment during the census reference year.

0905 Status in employment of main job (for each household member in employment, identifying the sex)

- Employee
- Self-employed
  - Employer
  - Own-account worker
  - Contributing family worker
  - Member of producers' cooperative
- Person not classifiable by status

Reference period: census reference year

8.9.35 For the purposes of this item, the main job over the census reference year is defined as the job in which the person has spent most of his/her time during his/her period of employment during the reference

year (a person may be classified as unemployed according to Item 0904 but still may be employed for a certain period during the reference year). This is different from the method used to determine the main job using a short-term reference period.

8.9.36 ***Status in employment*** refers to a classification of jobs held by persons, or of persons in employment, and uses two basic criteria to define the groups: (i) the type of economic risk associated with the job, including the strength of the attachment between the person and the job; and (ii) the type of authority exercised by the employed person over establishments and other workers. Note that labour force status in Item 0904 relates to whether the person was mainly in employment, in unemployment or outside the labour force during the reference year, while status in employment in Item 0905 refers to a classification based on the characteristics of a particular job of an employed person.

8.9.37 There are two types of jobs: paid employment jobs (i.e. jobs done by employees) and self-employment jobs. Paid employment jobs are those for which a person holds an explicit (written or oral) or implicit contract that provides remuneration payable in the form of wages and salaries for time worked or work done – i.e. not directly dependent on the revenue of the unit for which the person works. In a self-employment job, the remuneration is directly dependent on the profits derived from the goods and services produced through market transactions.

8.9.38. An ***employee*** is a person who works in a job for which an explicit or implicit contract provides remuneration not directly dependent on the revenue of the unit for which the person works. In other words, employees hold paid employment jobs. 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.

8.9.39 A ***self-employed*** person is one who works in a job for which the remuneration is directly dependent upon the profits (or the potential for profits) derived through market transactions from the goods and services produced. The term "self-employed" refers to all the subcategories defined in paragraphs 8.9.40 - 8.9.41 and 8.9.43 - 8.9.44.

8.9.40 An ***employer*** is a person who, working on his or her own account or with one or a few partners, holds a self-employment job and, in this capacity, has engaged on a continuous basis (including the reference period) one or more persons to work for him/her as employees. He/she makes the operational decisions that affect the enterprise, or delegates such decisions while retaining responsibility for the welfare of the enterprise.

8.9.41 An ***own-account worker*** is a person who, working on his/her own account or with one or a few partners, holds a self-employment job in a market-oriented establishment and has not engaged any employees on a continuous basis during the reference period. However, during the reference period an own-account worker may have engaged one or more employees on a short-term and non-continuous basis.

8.9.42 Note that agricultural holders employed in market-oriented holdings are considered employers if they engage employees on a continuous basis and own-account workers if they do not.

8.9.43 A ***contributing family worker*** is a person who holds a self-employment job in a market-oriented establishment operated by a related person living in the same household and who cannot be regarded as a partner (that is, an employer or own-account worker) because the degree of his/her commitment to the operation of the establishment, in terms of working time or other factors to be determined by national circumstances, is not at a level comparable with that of the head of the establishment. Thus, the agricultural holder of a market-oriented holding without continuously engaged employees 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 may be relaxed.

8.9.44 A ***member of a producers' cooperative*** is a person who holds a self-employment job in an establishment organized as a cooperative, in which each member takes part on an equal footing with other members in determining the organization of production, sales and/or other work, investments and the distribution of proceeds among the members.

8.9.45 ***Persons not classifiable by status*** include those persons with jobs for which insufficient information is available and/or who cannot be included in any of the preceding categories.

8.9.46 Item 0905 is presented according to the International Classification of Status in Employment (ICSE-93) (ILO, 1993), adopted by the 15th ICLS. At the time the WCA 2020 was developed, a revision of ICSE-93 was being planned, in line with the new framework on work statistics established by 19th ICLS, and is expected to be completed by 2018 when a new resolution on this topic will be presented to the 20th ICLS. For purposes of international comparison, it is recommended that countries assess the status of persons engaged in jobs (for employment work) or who performed work activities (for forms of work other than employment) in accordance with the latest ICLS standards.

0906 Form of payment for employees (for the holding)

Reference period: census reference year

8.9.47 Item 0906 is important in countries where there are various forms of remuneration for employees. 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 forms of payment groups are:

- Money
- Farm produce
- Exchange of labour
- Other forms of in-kind payment

If more than one form of payment is used on the holding, then all forms of payment practised by holdings should be reported.

0907 Use of contractors for work on the holding according to type (for the holding)

Reference period: census reference year

8.9.48 This item refers to whether agricultural service contractors were used for work on the holding during the census reference year.

8.9.49 Care should be taken to distinguish an agricultural service contractor from an employee on the holding, which is covered in Item 0903. According to the ICSE-93 (ILO, 1993), contractors are workers who: (a) have registered with the tax authorities (and/or other relevant bodies) as a separate business unit responsible for the relevant forms of taxes, and/or have made arrangements so that their employing organization is not responsible for relevant social security payments, and/or have a contractual relationship that is not subject to national labour legislation applicable to e.g. "regular employees"; and (b) hold explicit or implicit contracts which correspond to those of "paid employment".

8.9.50 According to national circumstances and needs, countries may wish to differentiate contractors according to the type of service provided by them, such as crop protection, tree pruning, crop harvesting, sheep shearing or farm administration.

THEME 10: INTRAHOUSEHOLD DISTRIBUTION OF MANAGERIAL DECISIONS AND OWNERSHIP ON THE HOLDING

Introduction

8.10.1 This theme replaces the "Management of the holding" theme and the implicit concepts of subholding and subholder that were introduced in the WCA 2010. The revised theme improves the approach for assessing the distribution of managerial decisions and introduces the identification of ownership within the household. The concept of the agricultural holder being the major decision-maker for the holding alone may not provide a realistic picture of the often complex decision-making process within a holding in the household sector. Often, different members of the household take responsibility for managing different aspects of the operation of the holding, or the responsibilities are shared between household members. The main purpose of this theme is to assess the role of gender in decision-making on the holding. In addition, countries also wishing to cover the distribution of ownership of assets on the holding may include the items explained in the second section of this theme.

8.10.2 Item 0103 on land tenure only captures the ownership status of each parcel at the holding level, but does not identify which of the household member(s) manage/own the parcel. Similarly for livestock, the proposed census items in Theme 5 do not identify the owners of the livestock owned or otherwise kept.

8.10.3 Some countries may wish to reflect more precisely the intrahousehold distribution of decision-making and ownership within the holding, particularly to investigate the gender-based differences in decision-making and owning of key agricultural assets, such as land and livestock. Such understanding should lead to improved gender sensitivity in policies and programmes.

8.10.4 In order to assess the role of gender in decision-making on the holding it is recommended that countries collect data on these items for each individual household member. This may require some effort to implement but it allows for the possibility of analysing managerial decisions not only by sex but also by other characteristics such as age and education. Alternatively, countries wishing to adopt an approach that is easier to implement could collect basic sex disaggregation of managerial decisions.

Distribution of managerial decisions

8.10.5 In general, two different levels of decisions can be distinguished on the holding. There are managerial decisions – for example "this year we plant maize" or "this year we market all our bean production" – and day-to-day operational decisions, such as when to weed or spray the crops or graze the livestock. When collecting data for Items 1001-1003 proposed below countries should focus on the managerial decisions.

8.10.6 As defined in paragraph 6.18, the holder or joint holders are responsible for major decisions made on the holding. Items 1001-1003 aim to capture not only managerial decisions made by the holder and joint holder but also by other household members.

1001 Sex of household members making managerial decisions

Reference period: census reference year

8.10.7 This item collects the sex of any household members (not just the holder or joint holder) making managerial decisions on the holding. The list of managerial decisions to be investigated depends on country specificities. An indicative list of possible categories of managerial decisions is given below:

- Area of land cultivated and area of land left fallow
- Types of crops grown
- Types of livestock raised
- Applying for agricultural credit
- Investing in capital assets (agricultural land improvement, construction of agricultural buildings, acquiring agricultural machinery, etc.)
- Marketing of agricultural products and/or livestock
- Types of inputs used (fertilizers, pesticides, irrigation, hired labour, etc.)

8.10.8 Countries are recommended to collect data for this item by identifying, for each household member, the managerial decision(s) made by him/her. Alternatively, countries could collect data for this item by indicating, for each managerial decision, whether it was made by a male or female household member, or jointly by male and female household members (see paragraph 8.10.4).

1002 Area of crops by sex of the person managing them

Reference period: census reference year

8.10.9 Countries are recommended to collect data for this item by identifying, for each household member, the areas of crops under his/her sole or joint management. (see paragraph 8.10.4) It may be suitable to group the crops into broad categories based on the ICC given in Annex 4. The crop grouping should take into account country specificities and allow a meaningful analysis by sex groups. One possible grouping is:

- Cereals
- Vegetables and melons
- Other temporary crops
- Permanent crops

8.10.10 Alternatively, countries could collect this item by indicating which of the crop areas collected in Items 0402 and 0406 are under the management of a male or female household member, or jointly managed by male and female household members, not only by the holder or joint holders (see paragraph 8.10.4).

1003 Number of livestock by sex of the person managing them

Reference period: census reference day

8.10.11 Countries are recommended to collect data for this item by identifying, for each household member, the numbers and types of livestock under his/her sole or joint management (see paragraph 8.10.4). It may be suitable to group livestock into broad categories based on the Classification of Livestock given in Annex 6. The livestock grouping should take into account country specificities and allow a meaningful analysis by sex groups. One possible grouping is:

- Bovine animals
- Sheep and goats
- Swine/pigs
- Camels and camelids
- Poultry and birds
- Other animals

8.10.12 Alternatively, countries could collect this item by indicating, out of the total number of each livestock type collected in Item 0501, the number under the management of a male or female household member, or jointly managed by male and female household members, not only by the holder or joint holders (see paragraph 8.10.4).

Distribution of land and livestock ownership

8.10.13 The purpose of Theme 10 is mainly to cover the distribution of managerial decisions on the holding. However, countries also wishing to cover the distribution of land and livestock ownership on the holding may include Items 1004 and 1005, explained below. Items 1004-1005 relate to all household members, including the holder or joint holders.

1004 Area of land owned by sex of the owner

Reference period: census reference year

8.10.14 This item applies only to that part of the holding's land which is owned by household members, including the holder. Some examples of forms of ownership are: reported ownership; documented ownership; and rights over the asset established through management and control. Countries are recommended to use the ownership forms that are most appropriate to their circumstances but fitting into one of the broad land tenure categories, "Legal ownership or legal owner-like possession" and "Non-legal ownership or non-legal owner-like possession", which are described in Item 0203.

8.10.15 Countries are recommended to collect data for this item by identifying, for each household member, the area owned solely or jointly by him/her. If an area is owned jointly by more than one household member, then it should be recorded as owned by each of them.

8.10.16 Alternatively, countries could collect data for this item by disaggregating the owned area collected in Items 0205 and 0207, into areas owned by a male or female household member, or jointly by male and female household members.

1005 Number of livestock owned by sex of the owner

Reference period: census reference day

8.10.17 This item applies only to the number of the livestock being kept on the holding that are owned by household members, including the holder. As in the case of land, countries should decide which forms of ownership to investigate.

8.10.18 Countries are recommended to collect data for this item by identifying, for each household member, the numbers and types of livestock owned solely or jointly by him/her. Under this option it may be suitable to group livestock into broad categories, as described in paragraph 8.10.11 for the case of livestock management. If a livestock item is owned jointly by more than one household member, then it should be recorded as owned by each of them.

8.10.19 Alternatively, countries could collect data for this item by indicating, out of the total number of each livestock type (collected in Item 0502), the numbers owned by a male or female household member, or jointly by male and female household members, including the holder.

THEME 11: HOUSEHOLD FOOD SECURITY

Basic household food security concepts

8.11.1 Household food security refers to the situation in which 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 procure enough food or if its members are unable to eat adequate safe or nutritious food due to limited resources. Food insecurity 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.

8.11.2 Household food security is a complex, multi-dimensional issue. 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, concerns about the quality or quantity of food eaten, and how people deal with food shortages. Access to health, sanitation and other services also affect a household's food security situation (FAO 2000).

8.11.3 Various approaches have been used to measure household food security. Some countries have developed a household food insecurity scale, which provides an overall assessment of where each household

lies on the spectrum between being food-secure and severely food-insecure, based on a series of food security-related questions. Other countries undertake in-depth surveys exploring different elements of household food security – including measures of the physical status of women and children in the household – which demand specific training of and skills in enumerators.

8.11.4 The ability to estimate with sufficient precision households' habitual food consumption patterns is limited by the fact that food consumption is best recorded with reference to short and recent periods of time (e.g. the last 24 hours). To be able to control for the normal variability in daily food consumption, therefore, the information needs to be collected more than once, with repeated visits to the household and relevant cost implications. Also, a proper methodology needs to be developed to convert the information collected into a meaningful measure that can be compared over time and across different household groups or populations.

8.11.5 For this reason, including food security in the census of agriculture is challenging. For those countries wishing to assess food security through a supplementary module in the census of agriculture, the WCA 2010 recommended two broad food security indicators: (i) food shortages faced in a twelve- month reference period; and (ii) fear of a food shortage in the coming twelve months. However, experience has shown that the analysis of these data and their translation into a standard scale comparable over time or regions is problematic.

8.11.6 In 2013, the FAO project Voices of the Hungry (VoH), developed an innovative approach to access timely and valid information on the severity of food insecurity as experienced by individuals in the population. The approach aims to measure household food security in a reliable and relatively inexpensive way through experience-based food insecurity scales. These are developed on the premise that the severity of the food insecurity situation of an individual or a household can be inferred from observing typical behaviours and experiences associated with food insecurity. These include, for example, the condition of being worried about not being able to procure food, having to compromise on the variety and quality of foods consumed, and being forced to cut portions or to skip meals.

8.11.7 Through this approach, the food insecurity experience is measured by means of eight subitems or questions aimed at revealing what has been actually experienced by a given individual or by the members of a given household. Compromises on the quality/variety of food consumed can be explored by asking whether respondent had to "eat less expensive food" or had not "been able to eat a diverse diet", etc. The concept of "food shortage", for example, could be approached by asking about "running out of food in the house before having enough money to buy more", being forced to "skip meals", "cutting the size of meals" or "having had to go without eating for an entire day".

8.11.8 On the basis of the eight questions, FAO has developed a new standard, the Food Insecurity Experience Scale (FIES). The FIES is believed to represent a significant improvement over other tools that have been proposed and used in the past (such as the Food Consumption Score, or the Coping Strategy Index) and over the use of various items designed to collect information on the occurrence of food shortages, opinions on the causes of such shortages and information on coping behaviours. FIES is designed to yield a quantitative measure of the severity of a household's food insecurity condition, the latter term intended to describe the combined effect of the resource constraints people face when accessing food. The indicators resulting from the use of the FIES standard can be compared across countries and over time. For this reason, the WCA 2020 recommends the FIES approach to the measurement of food insecurity rather than the approach recommended in WCA 2010. It should also be recognized that this theme is relevant to all households and not just households with agricultural holdings. It may, therefore, be considered in a more general household survey and not restricted to households with agricultural holdings.

8.11.9 FIES's eight questions refer to adults in the household and are designed to elicit information on the severity of food insecurity measured along a single dimension. They should not be analysed independently from each other. The eight "Yes or No" answers must be analysed jointly to provide a reliable measure of severity associated with the household. The answers to all eight questions should be treated as a single item

that yields a measure of the food insecurity situation of the household (or of the individual) along a scale of severity that ranges from being food-secure, to mildly food-insecure, to moderately food-insecure, up to severely food-insecure.

8.11.10 The FIES questions provided below are worded to be as universally relevant as possible. However, the scale will be used in a wide variety of settings with cultural and language differences which may influence how the questions are understood and answered. It is therefore very important to make sure that the questions, as formulated in the language of administration, are appropriate for the populations being surveyed. In order to assist with this, FAO has carried out extensive linguistic adaptations in several national languages that are linguistically and culturally appropriate and faithful to the intention of the FIES questions. For further information the reader may refer to the publication The Food Insecurity Experience Scale: User Guide (FAO, 2013).

8.11.11 The guidelines for the FIES questions are provided in the paragraphs below. In addition to these, other supplementary items can be considered that will collect information on the consequences of natural disasters, in countries where such disasters have occurred in the recent past.

Items

1101 The food insecurity experience scale (fies)

1101(a) *[During the last 12 MONTHS, was there a time when] you [or any other adult in your household] were worried you would not have enough food to eat because of a lack of money or other resources?*

1101(b) *[During the last 12 MONTHS, was there a time when] you [or any other adult in your household] were unable to eat healthy and nutritious food because of a lack of money or other resources?*

1101(c) *[During the last 12 MONTHS, was there a time when] you [or any other adult in your household] ate only a few kinds of foods because of a lack of money or other resources?*

1101(d) *[During the last 12 MONTHS, was there a time when] you [or any other adult in your household] had to skip a meal because there was not enough money or other resources to get food?*

1101(e) *[During the last 12 MONTHS, was there a time when] you [or any other adult in your household] ate less than you [he/she] thought you [he/she] should because of a lack of money or other resources?*

1101(f) *[During the last 12 MONTHS, was there a time when] your household ran out of food because of a lack of money or other resources?*

1101(g) *[During the last 12 MONTHS, was there a time when] you [or any other adult in your household] were hungry but did not eat because there was not enough money or other resources for food?*

1101(h) *[During the last 12 MONTHS, was there a time when] you [or any other adult in your household] went without eating for a whole day because of a lack of money or other resources?*

Reference period: census reference year

8.11.12 1101(a) You [or any other adult in your household] were worried you would not have enough food to eat because of a lack of money or other resources.

8.11.13 This question refers to a state of being worried, anxious, apprehensive, afraid or concerned that there might not be enough food or that the respondent will run out of food because there is not enough money or other resources to get food. The worry or anxiety is due to circumstances affecting the respondent's ability to procure food, such as: loss of employment or other source of income, or other reasons for not having enough money; insufficient food production for own consumption; insufficient food available for hunting and gathering; disrupted social relationships; loss of customary benefits or food assistance;

environmental or political crises. It is not necessary for the respondent to have actually experienced not having enough food or running out of food to answer yes to this question.

8.11.14 1101(b) You [or any other adult in your household] were unable to eat healthy and nutritious food because of a lack of money or other resources.

8.11.15 This question asks the respondent whether s/he was not able to get foods they considered healthy or good for them, foods that make them healthy, or those that make a nutritious or balanced diet because there was not enough money or other resources to get food. The answer depends on the respondent's own opinion of what they consider to be healthy and nutritious foods. This question refers to the quality of the diet and not the quantity of foods eaten.

8.11.16 1102(c) You [or any other adult in your household] ate only a few kinds of foods because of a lack of money or other resources.

8.11.17 The question asks if the respondent was forced to eat a limited variety of foods, the same foods, or just a few kinds of foods every day because there was not enough money or other resources to get food. The implication is that the diversity of foods consumed would likely increase if the household had better access to food.

8.11.18 Alternative phrases that could be used to convey the same meaning are:

- You ate meals with a limited variety of foods;
- You ate the same foods or just a few kinds of foods every day;
- You had to eat a limited variety of foods;
- You had to eat the same foods every day;
- You had to eat just a few kinds of foods.

8.11.19 This question refers to quality of the diet and not the quantity of foods eaten. It implies lack of money/resources rather than customary habits or other circumstances (i.e. health or religion) as the reason for limiting the variety of food.

8.11.20 1102(d) You [or any other adult in your household] had to skip a meal because there was not enough money or other resources to get food.

8.11.21 This question inquires about the experience of having to miss or skip a major meal (for example, breakfast, lunch or dinner, depending on the norm for number and times of meals in the culture) that would normally have been eaten because there was not enough money or other resources to get food. This question refers to insufficient quantity of food.

8.11.22 1102(e) You [or any other adult in your household] ate less than you thought you should because of a lack of money or other resources.

8.11.23 This question inquires about eating less than what the respondent considered they should, even if they did not skip a meal, because the household did not have money or other resources to get food. The answer depends on the respondent's own opinion of how much they think they should be eating. This question refers to quantity of foods eaten and not the quality of the diet. It should never be intended as referring to special diets to lose weight or for health or religious reasons.

8.11.24 1102(f) Your household ran out of food because of a lack of money or other resources.

8.11.25 Reference should be made to any occasion when there was actually no food in the household because members did not have money, other resources, or any other means to get food.

8.11.26 1102(g) You [or any other adult in your household] were hungry but did not eat because there was not enough money or other resources for food.

8.11.27 This question asks about the physical experience of feeling hungry, and specifically, feeling hungry and not being able to eat enough because of a lack of money or resources to get enough food. It does not refer to possible consequences of special diets to lose weight or of fasting for health or religious reasons.

8.11.28 1102(h) You [or any other adult in your household] went without eating for a whole day because of a lack of money or other resources.

8.11.29 This question asks about a specific behaviour—not eating anything all day because of a lack of money and other resources to get food. It does not refer to special diets to lose weight or to fasting for health or religious reasons.

8.11.30 While the scale is ideally designed to measure the individual experience of food insecurity, the questions can be adapted to measure the severity of household food insecurity, by adding the expression "or any other adult in your household" where relevant, as indicated in brackets.

1102 Effects of natural disasters (for the household)

Reference period: census reference year

1103 Extent of loss of agricultural output due to natural disasters (for the household)

Reference period: census reference year

8.11.31 Items 1102 and 1103 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.

8.11.32 Item 1102 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

8.11.33 A household may have suffered because of more than one disaster and this should be reported accordingly.

8.11.34 Item 1103 covers the extent of the loss as a result of the disasters reported in Item 1104. The ***extent*** of the loss of agricultural output should be measured according to suitable criteria, such as:

- None
- Slight
- Moderate
- Severe

8.11.35 Normally, Item 1103 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 percent lower; ***severe*** – more than 40 percent lower. Similar criteria can be used for livestock.

THEME 12: AQUACULTURE

8.12.1 The content of this theme has been modified to harmonize with the SEEA Land Use Classification (see paragraphs 8.2.8 – 8.2.9). The current theme describes the basic items proposed for aquaculture. For further information the reader may refer to the publication Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework (Global Strategy, 2015).

1201 Presence of aquaculture on the holding

Essential and frame item. Reference period: census reference year

8.12.2 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 a complete picture of aquaculture activities in a country, the frame must include all aquaculture holdings at both the household and non-household levels, and not just those associated with an agriculture holding. For more information on the treatment of aquaculture in the context of the national accounting framework, see Annex 1.

8.12.3 ***Aquaculture*** is the farming of aquatic organisms such as fish, molluscs, crustaceans, plants, crocodiles, alligators and amphibians, and falls under group 032 of ISIC (Rev. 4). 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 take place in freshwater or saltwater.

8.12.4 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.

8.12.5 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 to be aquaculture. Limited enhancement actions taken to increase fish production, such as modifications to the aquatic habitat, should not be considered to be aquaculture.

8.12.6 Data on aquaculture usually relate to activities carried out over a twelve-month period, usually the census reference year.

1202 Area of aquaculture according to type of site (for the holding)

- Land-based
  - Arable land
  - Non-arable land
- Inland waters
- Coastal waters

Reference period: census reference year

8.12.7 ***Area of aquaculture*** refers to the area under water used for aquaculture on the holding. This may be of three types: land-based; based on inland water; and based on coastal waters. The two latter types of area are parts of bodies of water, usually 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 area figure should include supporting structures such as pond banks and floating structures of cages.

8.12.8 ***Land-based*** aquaculture is aquaculture practised in rice fields, ponds, tanks, raceways and other land areas on the holding. In the case of ponds, countries may need to develop criteria to distinguish between land-based and inland water aquaculture. Such criteria may include size of the pond, whether it is artificial or natural, whether cages and hapas (see paragraph 8.12.12) are used, etc. The area of land-based hatcheries should be included, while the area of land-based aquaculture-related facilities, such as storage buildings, fish processing facilities, laboratories and offices, should not be included. 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 8.2.35 for the definition of arable land. From the land use point of view, all land-based areas of aquaculture, except the one classified as arable land, should be classified as LU8 "area used for aquaculture" (see Figure 1) or more specifically to "land used for aquaculture" if a country wishes to further subdivide the class LU8 in line with the SEEA land use classification (see SEEA land use class 1.3 in Annex 8).

8.12.9 ***Inland waters*** include dams, reservoirs, lakes and rivers. ***Coastal waters*** include lagoons, estuaries, shallow and open seas, bays and coves, including inter-tidal mudflats. The area of aquaculture should refer to the part of the body of water that is occupied by the aquacultural facilities – for example, the total area of the pen or cage network in the water. Area of aquaculture based on inland waters and coastal waters should be classified as LU8 "area used for aquaculture" (see Figure 1) or more specifically to "inland waters used for aquaculture or holding facilities" and "coastal waters used for aquaculture or holding facilities", respectively, if a country wishes to further subdivide the class LU8 in line with the SEEA land use classification (see SEEA land use classes 2.1 and 3.1 in Annex 8).

8.12.10 The reference period for data on area of aquaculture is the census reference year.

1203 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

Reference period: census reference year

8.12.11 ***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 broodstock 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.

8.12.12 ***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.

8.12.13 ***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 at the four corners in open water bodies.

8.12.14 ***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.

8.12.15 ***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.

8.12.16 The reference period for data on area of aquaculture is the census reference year

1204 Type of water (for the holding)

- Freshwater
- Brackish water
- Saltwater

Reference period: census reference year

8.12.17 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 1202.

8.12.18 ***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.

1205 Sources of water for aquaculture (for the holding)

- Rain-fed
- Groundwater
- Rivers/canals
- Lakes/reservoirs
- Dams
- Estuaries/lagoons
- Coves/bays/sea

Reference period: census reference year

8.12.19 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 1202. Countries may wish to adapt these categories to suit local conditions.

1206 Type of aquacultural organism cultivated (for the holding)

- Freshwater fish
- Diadromous fish
- Marine fish
- Crustaceans
- Molluscs
- Other aquatic animals
- Aquatic plants

Reference period: census reference

8.12.20 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".

8.12.21 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 13: FORESTRY

1301 Presence of woodland on the holding

Frame item. Reference period: the day of enumeration.

8.13.1 Holdings with wooded areas can be identified through Item 0202 "Area of holding according to land use types". If some area of the holding is classified as "forest and other wooded land" (refer to paragraph 8.2.28-8.2.29 for the definition of this land use category), then the holding definitely contains some wooded areas. However, this may not be sufficient for identifying all holdings with wooded areas potentially usable for forestry activities or other purposes.

8.13.2 Firstly, land use classification is based on the concept of main use of the land. Some holdings may have land that is not classified according to the land use "forest and other wooded land" but contains groups of forest trees or other wooded plants satisfying the criteria for "forest and other wooded land". For example, "land under permanent meadows and pastures" may span over 0.5 ha and contain forest trees and other wooded plants more than five metres in height with crown cover of more than 10 percent. To identify all holdings with forest and other wooded land, data on secondary land use are needed.

8.13.3 Secondly, the criterion of spanning over 0.5 ha limits the capacity of the land use approach for identifying all holdings with wooded areas potentially usable for forestry activities or other purposes. In some countries, small wooded areas on holdings may play an important role in sustaining livelihoods of the households operating them. Because of the 0.5 ha criterion, such areas might be classified as "other area" (land use class LU9 in Figure 1, see also paragraph 8.2.34).

8.13.4 Because of the above considerations, the concept of woodland is introduced for the purposes of the present theme. It refers to the area of land satisfying all criteria for either forest land or other wooded land (see paragraph 8.2.28) except the criterion of spanning over 0.5 ha. Presence of woodland refers to whether such areas are present on the land making up the agricultural holding. The reference period is the day of enumeration.

1302 Area of woodland (for the holding)

- Forest land as primary land use
- Other wooded land as primary land use
- Forest land as secondary land use on agricultural land
- Other wooded land as secondary land use on agricultural land
- Other woodland

Reference period: the day of enumeration

8.13.5 This item collects data on the total area of woodland on the holding as defined in paragraph 8.13.4 further subdivided into various components. The total area of forest and other wooded land as a primary land use is given in the land use classification in Item 0202 (see paragraph 8.2.28). Subitems a. and b. subdivide it into its two components. Subitems c. and d. refer to those areas on the holding that satisfy the criteria for forest land and other wooded land (see paragraph 8.2.28), respectively, but were classified as agricultural land according to their primary land use. ***Agricultural land*** covers arable land, land under

permanent crops, and permanent meadows and pastures (see paragraph 8.2.35). Subitem e. covers those areas that span less than 0.5 and satisfy all other criteria for either forest land or other wooded land.

1303 Purposes of woodland (for the holding)

- Production
- Soil and water protection
- Improving agricultural production
- Social and cultural values
- Recreation and ecotourism
- Other

Reference period: the census reference year

8.13.6 This item relates to all woodland on the holding, including all categories listed in Item 1302. ***Purposes*** are assessed with respect to an extended period, usually the census reference year. Production refers to the production and extraction of forest goods, including both wood (timber, firewood, wood chips) and non-wood (wild-growing mushrooms, berries and nuts, oils, leaves, bark) forest products.

8.13.7 ***Soil and water protection*** refers to protection of soils from wind and water erosion. Forests conserve water by increasing infiltration, reducing runoff velocity and surface erosion, and decreasing sedimentation. Forests play a role in filtering water pollutants, regulating water yield and flow, moderating floods, enhancing precipitation and mitigating salinity.

8.13.8 ***Improving agricultural production*** refers to the various situations in which trees are integrated into agricultural systems, providing a range of benefits in terms of restoring or sustaining soil fertility and boosting food production. For example, in upland areas, where steep slopes and high rainfall create a high risk of erosion, trees help to stabilize topsoils and prevent loss of important nutrients, helping to maintain agricultural production. In dryland and semi-arid areas, trees and woodlands provide shade to growing crops and protect them from extreme temperatures. Trees minimize soil water loss through evaporation and transpiration and reduce wind speed and loss of topsoil through wind erosion. Trees planted in windbreaks and shelterbelts protect agricultural land and infrastructure.

8.13.9 ***Social and cultural values*** as a purpose refers to the situation in which forest area is primarily designated or managed for spiritual or cultural values or for public recreation – e.g. forests or other religious areas, spirit forests, sacred areas, burial grounds, initiation areas, taboo areas or areas related to other forms of community spiritual or cultural practices.

8.13.10 Increased attention is being given to the development of forest-based ***recreation and ecotourism***, driven by the overall expansion of the tourism sector, including agrotourism, and the special capacity of forests to improve the living environment and provide various amenities. Ecotourism can conserve natural resources, provide employment opportunities and boost the rural economy.

8.13.11 ***Other*** includes woodland with no specific function.

1304 Whether agroforestry is practised (for the holding)

Frame item. Reference period: the census reference year

8.13.12 ***Agroforestry*** is a sustainable land management system in which forest species of trees and other wooded plants are purposely grown on the same land as agricultural crops or livestock, either concurrently or in rotation. Agroforestry is characterized by the existence of both ecological and economic interactions between the different components. Agroforestry includes agrosilvicultural (trees and crops), silvopastoral (trees and livestock), and agrosilvipastoral (trees, crops and livestock) systems.

8.13.13 Agroforestry 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. Countries need to develop their own procedures to collect data on agroforestry systems. Some may wish to collect data on specific agroforestry activities. The reference period for agroforestry data is the census reference year.

THEME 14: FISHERIES

8.14.1 This module provides items for capture fisheries activities conducted at household level. It is not intended to cover the activities of large-scale commercial fishing enterprises. Household capture fisheries activities remain outside the scope of the agriculture census as defined under ISIC (Rev. 4) (as described in paragraph 6.24). However, the theme is of interest to many countries

8.14.2 The items can be collected either for fishers who also have agricultural holdings, or for other households as well when conducting a wider agricultural census. When conducted within the scope of the agricultural census, the items would be collected only for fishers who also have holdings. In this case, the data collected would not provide a complete frame of household capture fisheries activities or a complete picture of household fisheries in the country; they would only allow for cross-analysis with agricultural items.

8.14.3 Countries may wish to conduct a wider agricultural census in which additional data related to agriculture are collected for other households, in addition to those with holdings (as discussed in Chapter 5). In this case the items would be applied to both agricultural and non-agricultural production households. Approaches to enumeration for units which are outside the scope of the agriculture census are discussed in Chapter 5. These data would provide a more complete account of household fishing activities. For further information the reader may refer to the publication Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework (Global Strategy, 2015).

1401 Engagement of household members in fishing activity

- in the household
- in other economic units

Frame item. Reference period: census reference year

8.14.4 A household member is a person forming part of the household. The definition of the household is given in paragraph 6.5.

8.14.5 The item refers to households in which any member is engaged in either marine or freshwater capture fishing activities, regardless of the amount of time engaged. Engagement in household fishing relates to own-account fishing activity of the household – i.e. for own final use or for sale/barter. Engagement "in other economic units" refers to member(s) of the household engaged in capture fishing activity outside of the household, i.e. in another household, fishing enterprise or other economic unit.

8.14.6 The item does not cover households with members engaged only in the processing of products from fisheries (defined under ISIC Rev.4 class 1020) or only in trading of products from fishing. Trading refers to exchange of products in kind (including barter) or for monetary payment.

8.14.7 Capture fisheries falls under group 031 of ISIC (Rev. 4) and covers both marine fishing and freshwater fishing. It includes "the hunting, collecting and gathering activities directed at removing or collecting live wild aquatic organisms (predominantly fish, molluscs and crustaceans) including plants from the oceanic, coastal or inland waters for human consumption and other purposes by hand or more usually by various types of fishing gear such as nets, lines and stationary traps. Such activities can be conducted on the intertidal shoreline (e.g. collection of molluscs such as mussels and oysters) or [using] shore-based netting, or from home-made dugouts or more commonly using commercially made boats in inshore, coastal waters or offshore waters. Unlike in aquaculture (group 032 of ISIC Rev.4), the aquatic resource being captured is usually common property resource irrespective of whether the harvest from this resource is undertaken with

or without exploitation rights. Such activities also include fishing restocked water bodies." Fishing activity excludes raising fish, molluscs and crustaceans in captivity, which is covered under Theme 12: Aquaculture.

8.14.8 Fishing includes any activity – other than scientific research conducted by a scientific research vessel – that involves the catching, taking or harvesting of fish or any attempt to do so, or any activity that can reasonably be expected to result in the catching, taking or harvesting of fish and any operations at sea in support of it.

1402 Number of household members engaged in fishing activity by sex

Total of which engaged in:

- the household's fishing activity
- other economic units

Reference period: census reference year

8.14.9 The purpose of this item is to obtain information regarding the number of household members engaged in:

a) household fishing activity – i.e. for the household's own-account capture fisheries; and/or
b) capture fishing activity outside of the household – i.e. in other households, fishing enterprises or other economic units.

8.14.10 If a household member has been engaged in capture fishing activity both in the household and in another economic unit, he/she should be counted only once and assigned to the activity/unit in which he/she has spent the most time during the reference year.

8.14.11 Countries may wish to quantify the volume of work contributed by household members engaged in the household's fishing activity. The measurement of working time related to fishing activity of household members could be based on the assessment of hours or days engaged in the holding's fishing activity, or by using broad categories such as full-year/part-year or full-time/part-time, as feasible and relevant to national circumstances. 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 a norm such as an 8-hour day or a 40-hour week.

8.14.12 Data regarding gender are important to capture accurate information on the activities of women in fishing.

1403 Number of fishers by sex employed by the household

Reference period: census reference year

8.14.13 This item refers to paid workers engaged in fishing activities of the fishing households – i.e. workers who are NOT household members. These are persons who had a job in fisheries activities for the household fishing enterprise at some time during the reference year and whose status in employment for that job was "employee", meaning they worked for the household fishing enterprise at some time during the year in a paid employment job. This includes regular employees, as well as seasonal, short-term and casual workers. Employees may be paid in cash or in the form of food or other products, but there may also be other remuneration arrangements. Exchange of labour should be treated as a form of paid employment. Persons employed by the household but not working in fishing are excluded. Family members are covered in item 1402 and are excluded here. Countries may wish to quantify the volume of work contributed by employed fishers. Working time data for employees engaged in fishing activities of the household should be consistent with the similar data for household members (see paragraph 8.14.11).

1404 Access arrangements for fishing

- Access arrangement for marine fishing
- Access arrangement for freshwater fishing
- No access arrangement required for marine fishing
- No access arrangement required for freshwater fishing

Reference period: census reference year

8.14.14 This item refers to access arrangements for individuals to utilize aquatic resources for the purpose of fishing. Access arrangements include formal (such as licences) and informal tenure given to either individuals or communities. Tenure systems are used to regulate access to natural resources such as fish stocks and can be informal or established formally through legislation or through community customs.

8.14.15 Marine fishing refers to fishing in oceans and seas, including adjacent saltwater and shore areas; freshwater fishing refers to fishing in inland waters, including lakes, rivers, brooks, streams, ponds, inland canals, dams and other landlocked water areas, regardless of water salinity.

1405 Main purpose of household fishing activity

- Producing mainly for own consumption
- Producing mainly for sale

Reference period: census reference year

8.14.16 The aim of this item is to get a broader indicator of the extent of participation in the market economy. In cases where the household fishing is for more than one purpose, the main purpose should be the one which represents the larger value of products from fishing.

8.14.17 Sale includes selling produce for cash or in exchange for other produce (barter). Disposal of fishing products in other ways, such as payment for labour, sending to family members, gifts or payments of taxes, should not be considered in assessing main purpose.

1406 Type of fishing vessel used by source

a) Motorized vessels:
- owned solely by household members
- owned by the household jointly with other households
- lent from others (with or without payment)

b) Non-motorized vessels:
- owned solely by household members
- owned by the household jointly with other households
- lent from others (with or without payment)

c) No vessel used

Reference period: census reference year

8.14.18 This item refers to the use of a vessel for fishing. Motorized vessel refers to the use of motors, either inboard or outboard, for propulsion. It does not include vessels on which motors are used only for powering winches or equipment. In some cases fishing takes place from the shore or on the shore, in which case a vessel is not used.

1407 Type of fishing gear used

Reference period: census reference year

8.14.19 This item refers to the type of fishing gear used by the fisher. The following classifications, based on the International Standard Statistical Classification of Fishing Gears, ISSCFG (FAO, 1990), are recommended for collecting information on fishing gear:

- Surrounding nets
- Seine nets
- Trawls
- Dredges
- Lift nets
- Falling gear
- Gillnets and entangling nets
- Traps
- Hooks and lines
- Grappling and wounding
- Harvesting machines
- Miscellaneous gear (including gathering by hand with simple hand implements)

8.14.20 Detailed descriptions of gear under each category are available in the Definition and classification of fishing gear categories (FAO, 1990). The category of miscellaneous gear includes hand and landing nets, drive-in nets, gathering by hand with simple hand implements with or without diving equipment, poisons and explosives, trained animals, electrical fishing, etc.

8.14.21 At the time the WCA 2020 was developed, a revision of ISSCFG was under way. For purposes of international comparison, it is recommended that countries use the categories of fishing gear in accordance with the latest ISSCFG classification.

THEME 15: ENVIRONMENT/GREENHOUSE GAS (GHG) EMISSIONS

8.15.1 In response to the growing demand for basic agro-environmental data on GHG and ammonia emissions, as well as for compilation of nitrogen balances, the WCA 2020 includes a new theme with a set of items that can help countries assess their emissions, with a view to improving their national GHG inventories, thus enabling planning for effective climate change responses and facilitating access to international funding.

8.15.2 The theme specifically addresses the internationally agreed commitments of countries to regularly report to the UNFCCC their national inventories of GHG emissions by sources and removal by sinks from all sectors, including agriculture. Items in this theme cover relevant crop and livestock production subsectors, focusing on critical new items needed by countries to produce more complete and more accurate GHG inventories, in line with the international guidelines of the Intergovernmental Panel on Climate Change (IPCC), approved by UNFCCC. Some of the items proposed are already covered in other themes of the WCA 2020 and therefore in this theme only a reference to them is given. For further information the reader may refer to the publication *Estimating Greenhouse Gas Emissions in Agriculture – A Manual to Address Data Requirements for Developing Countries* (Global Strategy, 2014a).

8.15.3 Livestock production accounts globally for more than 40 percent of GHG emissions directly through enteric fermentation, and for over two-thirds of GHG and ammonia emissions from agriculture, considering enteric fermentation, manure storage and applications. Such relevance of GHG emissions is also found at national level in many countries. Thus, a more detailed breakdown of livestock on the holding is necessary to improve inventories and more effectively measure the effect on the environment.

8.15.4 Wherever cattle population dominates livestock categories in a given country, the minimum breakdown should include a distinction between dairy and no-dairy (i.e. beef) cattle population. Furthermore, the following three items covered in Theme 5: Livestock are relevant to emissions calculations.

0501 Type of livestock system

8.15.5 This item is defined in Theme 5 Livestock.

0504 Number of animals: age and sex (for each livestock type)

8.15.6 This item is defined in Theme 5 Livestock.

0505 Number of animals according to purpose (for each livestock type)

8.15.7 This item is defined in Theme 5 Livestock.

1501 Type of animal grazing practices

Reference period: census reference year

8.15.8 Animal grazing is practically the only source of feed for livestock raised under the grazing system (see Item 0501 "Type of livestock system"). However, this item is not needed for the nomadic livestock category. Grazing is also a common practice under the mixed system but is rarely applied under the industrial system.

8.15.9 Animal grazing has a significant impact on the quality of pastures. Combining the information from the livestock module with the grazing categories below improves estimation of the status of pastures – non-degraded, moderately degraded or severely degraded. Importantly, this item allows for more accurate estimation of the area in which manure is left on pasture. The latter process represents the second largest source of GHG agriculture emissions globally, as well as in many countries where livestock is a dominant production activity.

8.15.10 The agriculture census distinguishes between two types of animal grazing:

- Grazing on the holding :
  - Area grazed during the year;
  - Number of animals
  - Fraction of the year with animals on pasture
- Common pasture grazing:
  - Number of animals
  - Fraction of the year with animals on pasture

8.15.11 ***Common pasture*** refers to land not belonging directly to agricultural holding, but on which common rights apply. In general terms, common pasture is agricultural area owned by a public authority (state, parish, etc.) over which another person is entitled to exercise rights of common, and these rights are generally exercisable in common with others. Pastures which are rented or over which the holder enjoys rights allotted by the parish or other organization – e.g. common grazing land apportioned on an acreage basis – are not included here.

8.15.12 ***Area grazed during the year*** means the total area of pastures owned, rented or otherwise allocated to the agricultural holding on which animals were kept for grazing during the reference year. The grazed area can also be harvested by mowing or other means.

8.15.13 ***Number of animals*** means the total number of animals of the holding grazed outdoors. If the animals are grazed more than one time during the reference year, they are counted only once.

8.15.14 ***Fraction of the year with animals on pasture*** refers to the approximate length of time that the animals spent outside on the pasture (owned, rented or otherwise allocated to the agricultural holding or on common pasture) during the census reference year. The fraction is determined regardless of whether

the animals were also on pasture during the night or spent the night indoors. The fraction can be asked as approximate number of months or in time classes:

- Up to 3 months
- From 3 to less than 6 months
- From 6 to less than 9 months
- More than 9 months

8.15.15 Usually, the time with animals outside on the pasture is the same for all the holdings practicing animal grazing in a given area. Thus an expert estimate or small sample of holdings would provide the necessary information.

1502 Manure application

Reference period: census reference year

8.15.16 This item is relevant for the calculation of agro-environmental indicators and particularly for GHG and ammonia emissions. It is not applicable to holdings with a nomadic livestock system (see Item 0501 "Type of livestock system").

- Percentage of holding's pastures on which the manure is left on pasture by livestock (this category is not necessary if items on animal grazing are included)
- Fraction of manure left on pasture that is removed for use as fuel
  - Nothing is removed
  - Up to 50 percent is removed
  - More than 50 percent is removed but not all
  - All manure is removed
- Agricultural area on which solid/farmyard manure is applied (spread)
- Agricultural area on which slurry is applied (spread)
- Manure directly daily spread on the field

(see definitions in paragraph 8.15.19)

1503 Manure management system

Reference period: census reference year

8.15.17 This item is relevant for the calculation of agro-environmental indicators and particularly for GHG and ammonia emissions. It is not applicable to holdings with a nomadic livestock production system (see Item 0501 "Type of livestock system").

- Availability of storage facilities for:
  - Solid/farmyard manure
  - Liquid manure
  - Slurry
- Type of storage facilities used:

For all manure:

  - Digesters (biogas reactors)

For slurry:

  - Slurry tank
  - Anaerobic lagoon
  - Aerobic treatment
- Covered or open storage facilities :
  - For solid/ farmyard manure
  - For liquid manure
  - For slurry

8.15.18 Cases may exist in which there are both covered and open storage facilities of the same type for one holding. Where feasible, information on the percentage of the capacity of the covered facilities could be asked.

8.15.19 For the purpose of the agriculture census, the following definitions will be used:

- ***Solid/farmyard manure*** is excrements (with or without litter) of domestic animals, possibly including a small amount of urine.
- ***Liquid manure*** is urine from domestic animals, possibly including a small amount of excrement and/or water.
- ***Slurry*** is manure in liquid form, a mixture of excrements and urine of domestic animals, possibly including water and/or a small amount of litter.
- ***Manure removed for use as fuel*** is dried dung cakes created and burned for fuel.
- ***Directly daily spread*** means the manure is routinely removed from the confinement facility and is applied to cropland or pasture within 24 hours of excretion; no storage is needed.
- ***Storage facility for solid/farmyard manure*** usually means a three-sided, rectangular or square structure with a concrete floor and reinforced concrete or timber walls. The floor may slope towards the open side where the seepage/drainage (liquid fraction) from the stacked solid manure is collected in a gutter and stored separately. A heap or stack of solid manure stored in a field prior to spreading is excluded.
- ***Storage facility for liquid manure/slurry*** usually means a watertight tank, open or covered, or a lined lagoon for storage of liquid manure/slurry.
- ***Slurry tank*** is a tank, usually made of impermeable material, used for the storage of slurry. Watertight pits or cellars beneath/integrated in the livestock houses are also included.
- ***Anaerobic lagoon*** is a pit dug in the soil, usually lined, used for the storage of slurry. Anaerobic lagoons are designed for varying lengths of storage, depending on the climate region, the volatile solids loading rate and other operating factors. The water from the lagoon may be recycled as flush water or used to irrigate and fertilize fields.
- ***Aerobic treatment*** is the biological oxidation of manure collected as a liquid with either forced or natural aeration. Natural aeration is limited to aerobic and facultative ponds and wetland systems and is due primarily to photosynthesis. Hence, these systems typically become anoxic during periods without sunlight.
- ***Storage facilities for manure are considered covered*** (by concrete lid, tent, tarpaulin, etc.) when they are protected from rain or other precipitation and the cover can reduce ammonia emissions.
- ***Digesters (biogas reactors)*** are reactors in which animal excreta, with or without straw and/or other materials such as wood shavings, sawdust, etc., are collected and anaerobically digested in a large containment vessel or covered lagoon. Digesters are designed and operated for waste stabilization by the microbial reduction of complex organic compounds to CO2 and CH4, which may be captured and flared or used for energy production.

1504 Final use of the treated manure

Reference period: census reference year

8.15.20 This item refers to percentage use of manure exiting the manure management system, and is applicable to all holdings with land and to landless holdings with a non-nomadic type of livestock system (see Item 0501 "Type of livestock system"). It refers to manure:

- applied as fertilizer;
- used for fuel;
- used for construction;
- used as feed;
- other uses

8.15.21 For the purpose of the agriculture census, ***final use for fuel*** refers to manure used for production of energy. Manure left on pasture, collected and dried for dung cakes burned for fuel is not reported here

but under Item 1502 "Manure application". ***Final use for construction*** means that manure is used as a component for preparing construction materials. ***Other*** describes those uses not mentioned in the previous categories, such as manure exported from the holding. Often the manure is sold or given for free to others for fertilizer.

0411 Use of each type of fertilizer

8.15.22 This item is covered in Theme 4: Crops. Data on the use of fertilizers and their type is relevant for the calculation of GHG and ammonia emissions.

0412 Area fertilized for each type of fertilizer and major crop type

8.15.23 This item is covered in Theme 4: Crops. Data on the use of fertilizers and their type is important for the calculation of GHG and ammonia emissions.

Submodule on rice cultivation

8.15.24 Rice cultivation accounts for 10 percent of global GHG emissions in agriculture, but is significantly higher in rice-producing countries. The following items are relevant to improve the accuracy of estimates of GHG emissions from rice cultivation.

1505 Length of the growing period for rice cultivation

Reference period: census reference year

8.15.25 Length of the growing period means number of months between crop planting and harvest.

1506 Rice cultivation - irrigation and water regimes

Reference period: census reference year

8.15.26 This item complements the information collected in Item 0305 "Area irrigated for each crop type" defined in Theme 3: Irrigation (see paragraphs 8.3.15-8.3.16), specifically for rice irrigation and water regimes. It is a holding-level item. However, for operational reasons, countries may find it easier to collect the data at field/plot level, as one holding could have different water regimes for different fields.

- Water regimes before the growing period:
  - Flooded pre-season
  - Non-flooded pre-season

8.15.27 ***Flooded pre-season*** means that the land has been flooded for at least 30 consecutive days or more just prior to planting.

8.15.28 Non-flooded pre-season means that the land has been flooded for less than 30 consecutive days or has not been flooded prior to planting.

- Water regimes during the growing period:
  - Irrigated – continuously flooded
  - Irrigated – intermittently flooded
  - Rice cultivation in rainfed and deep water area

8.15.29 ***Irrigated – continuously flooded*** means a field that has standing water throughout the rice growing period and may only dry out for harvest (end-season drainage).

8.15.30 ***Irrigated – intermittently flooded*** means a field that has at least one aeration period of more than three days during the growing period.

8.15.31 ***Rice cultivation in rainfed and deep-water area*** means rice grown on levelled bunded fields to allow an accumulation of flood water on the surface during heavy rains, in areas that depend entirely on

rain for water supply. Deep-water areas for rice cultivation are usually flooded deeper than 50 cm for one month or longer during the growing season.

1507 Organic amendments to soils used for rice cultivation

Reference period: census reference year

8.15.32 In addition to the information already asked in Item 0412 "Area fertilized for each type of fertilizer and major crop type" in Theme 4: Crops (see paragraph 8.4.46), the following further breakdown of the organic fertilizers used gives important information about the rice cultivation practices:

- Straw incorporated shortly before cultivation (30 days or less)
- Straw incorporated long before cultivation (more than 30 days)
- Compost
- Farmyard manure
- Green manure

8.15.33 ***Straw incorporated shortly before cultivation (30 days or less)*** means that straw is incorporated to soil no more than 30 days before the cultivation of rice.

8.15.34 ***Straw incorporated long before cultivation (more than 30 days)*** means that straw is incorporated to soil for longer than 30 days before the cultivation of rice.

8.15.35 ***Compost*** is a mixture of decaying organic substrates, such as from leaves and manure, used to improve soil structure and provide nutrients. Alternatively, it refers to organic substrates subjected to biological decomposition and stabilization and converted into a final product that is stable, free of pathogens and plant seeds, and can be beneficially applied to land (Haug, 1993).

8.15.36 ***Solid/farmyard manure*** - see paragraph 8.15.19.

8.15.37 ***Green manure/cover crops (GMCCs)*** are plants that are grown in order to provide soil cover and to improve the physical, chemical and biological characteristics of soil. GMCCs may be sown independently or in association with crops (FAO 2011).

1508 Crop residues

Reference period: census reference year

8.15.38 Management and use of crop residues may affect the environment. This item is applicable to all farms. Handling of crop residues includes the following:

- Crop/pasture area burnt on the holding
- Crop residues removed from field
- Pastures on the holding renewed during the crop year

8.15.39 Crop/pasture area burnt on the holding refers to the area of crop/pasture where crop residues/grass are burned during the reference year. Cases in which the residues are gathered up and burned in a pile, on or off the fields from which they came, are also included here.

8.15.40 ***Crop residues*** may consist of straw, stubble or other plant parts leaving good mulch that remain from the previous harvest.

8.15.41 ***Crop residues removed from field*** describes the fraction of crop residues which is not left on the field. This information only refers to those crop fields that are not burned.

8.15.42 ***Pastures on the holding renewed during the crop year*** refers to the area of pasture that is ploughed and seeded to produce a new grass cover. This information does not include the area of pasture renewed by fires, which is to be reported as "Crop/pasture area burnt on the holding".

8.15.43 Where feasible, information on areas should be collected.

1509 Permanent crops - age of plantations

Reference period: day of enumeration

8.15.44 Item 0406 "Area of productive and non-productive permanent crops in compact plantation" (for each permanent crop type) in Theme 4: Crops (see paragraphs 8.4.26 – 8.4.30) asks for area by permanent crop type.

8.15.45 In addition to item 0406, for the purpose of improving estimates of GHG emissions by sources or removals by sink, the following information from farms with commercial orchards is needed:

- Age of plantations (productive and non-productive)
- Age at which the permanent crops are renewed

0610 Types of tillage practices

8.15.46 This item is defined in Theme 6: Agricultural practices, Item 0610 "Types of tillage practices" (see paragraphs 8.6.26 - 8.6.32).

CHAPTER 9
COMMUNITY-LEVEL DATA

The collection of community-level data was first introduced in the programme for the WCA 2010 round. The current programme retains this feature. 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

9.1 The main focus of an agricultural census is usually on structural data collected at the holding level. 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.

9.2 However, some types of community-level data are of interest for policy-making, especially for planning of targeted development programmes. For example, data on the infrastructure and services available to holdings would be useful for planning policies aimed at improving rural infrastructure and services; data on whether the community is prone to natural disasters or subject to seasonal food shortages can be of interest for food security analysis. Although theoretically these and many other types of community-level data can be collected from the holdings as well, it is more practical to collect them at community level. Moreover, there are some community-level data, such as area of communal grazing land, area of communal forest, area equipped for irrigation, etc. that may be meaningfully collected only at the community level.

9.3 To meet the strong demand for community-level data, a community-level component was initially included in the WCA 2010. This proved to be useful and is therefore retained in the current programme. Countries are encouraged to include this element according to national circumstances and data requirements. Community-level data are of statistical interest for several reasons.

9.4 First, the data are of interest in their own right for analysing the characteristics of communities. For example, information on communities with or without an agricultural input supplier in the community 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.

9.5 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.

9.6 Third, community-level data may be used to complement the data collected at the holding level, especially regarding the area of agricultural land. For example, land in holdings may not represent the total amount of land used for agricultural purposes because of the existence of agricultural land not belonging directly to any agricultural holding – such as common agricultural land used for grazing (communal grazing land). This is important especially for pastoral areas, where considerable expanses of land may fall under community control. Thus, complementing holding-level land use data with community-level land use data will provide a complete picture of land used for agricultural purposes at the national and subnational levels.

9.7 An important factor in favour of the collection of community-level data in the agricultural census is its low additional cost for carrying out the census fieldwork. Sometimes, the community administration is involved in the census data collection itself or in the listing of households or holdings. In these circumstances, community-level data can be collected at little cost.

Methodological considerations

Defining a community as a statistical unit for community-level data collection

9.8 A ***community*** can be defined as a self-contained unit of social and economic activities (FAO 1983). Population and housing censuses use the similar concept of locality, which is "a distinct population cluster (also designated as inhabited place, populated centre, settlement and so forth) in which the inhabitants live in neighbouring sets of living quarters and that has a name or a locally recognized status" (UN, 2015b, paragraphs 4.89 - 4.91). Under these definitions, the community or locality may not be the same as the lowest administrative unit.

9.9 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 require that the community maintain 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.
- S***tability 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.

9.10 Deciding on the coverage 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 data collection to the communities containing agricultural holdings. Therefore, operationally it is convenient to cover those communities in a community survey as field staff need to visit them to enumerate the holdings. As some agricultural holdings are in urban areas, this would involve urban communities as well. However, it might prove difficult and even inappropriate to administer the community questionnaire in some urban communities. Countries should endeavour to cover at least all rural communities and those urban communities where community-level agriculture is present.

9.11 Community surveys are only applicable in countries with 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. When constructing the frame of community units, to avoid duplicate counting it is important to ensure that the areas of community units do not overlap.

Data collection

9.12 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 4.26 - 4.27). Often, the community units identified for the community survey are subdivided to form suitably sized EA units. In such cases, the most experienced of the supervisors or enumerators in charge of the data collection in the community could be assigned in advance to administer the community questionnaire.

9.13 Where the community administration prepares the list of households or holdings for the agricultural census, it may be possible to ask representatives of the community administration to complete the

community questionnaire as well. Often, census field staff members personally visit each community to obtain the household/holding list, and this can provide a good opportunity to meet appropriate persons in the community and collect the community-level data.

9.14 Community administration 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 data for the community questionnaire can be collected from relevant persons at a suitable time.

9.15 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 to allow the community administrations to fill out the questionnaire themselves. Cost may be a factor in this regard.

Use of sampling methods

9.16 If the census is carried out on a complete enumeration basis, the community survey should be done on the same basis; to survey only a sample of communities in conjunction with a full enumeration census of holdings, implying just marginal cost savings, 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.

9.17 However, sampling methods may be suitable where the census is done on a sample basis. In a typical sample-based census, 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. For the community survey those communities that contain sampled EAs could be used, 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 community survey organized in this way 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, such an approach may not be suitable for summarizing community-level data because the sample of the communities so obtained cannot be considered as representative of all communities. To ensure the representativeness of the community survey data, the sample of EAs for the agricultural census could be selected via a two-stage procedure: first select a random sample of communities (to use in the community survey) out of all in-scope communities, and then select EAs randomly in each sampled community (for holding-level data collection).

Community-level items

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

9.19 Countries should make every effort to coordinate community-level data from the different sources. Many countries maintain community registers or databases, sometimes based on the population census. If a common geographic coding system of communities exists in a country, the agricultural census should use this system in the identifiers of agricultural holdings and during community-level data collection, so that its data can be linked with existing community registers or databases and duplicate collection of data already available is avoided. The agricultural census could then focus on just the agriculture-related data.

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

- 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 for getting data that are better collected directly from holdings. For example, data on crops grown and livestock raised should be collected directly from holdings, not by asking a community official to provide estimates.

- Communities should not be asked to report the same data as holdings. The only exception could be land use data from community records. If they are deemed to be of good quality and their concepts and definitions are compatible with those adopted for the agricultural census, they could be used for checking at the aggregate level the land use data reported by holdings.
- The community survey should not be used for collecting data available from other reliable statistical and administrative data sources.
- 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-level data is given in paragraphs 10.28 - 10.32.
- 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 infrastructure and services exist.
- The number of community-level items should be kept to a minimum – normally 10-20 items.

9.21 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 registers or 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 Communal area under water used for aquaculture
2107 Travelling time and the associated mode of travel to the nearest major urban centre (by season, if applicable)
2108 Whether the community has year-round access to the nearest urban centre by a motorable road
2109 Whether the community is prone to natural disasters, such as droughts and floods (if applicable)

Socio-economic conditions

2201 Population according to population group
2202 Number of households
2203 Economic status (if applicable)
2204 Main 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 needed, further broken down by specific types: animal health post/clinic, veterinarian, animal health assistant, dipping tank); 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 Whether the community is covered by the agricultural produce collection network
2310 Presence of food storage facilities; if not, travelling time to the nearest food storage facility (by season, if applicable)
2311 Presence of agricultural processing facilities; if not, travelling time to the nearest agricultural processing facility (by season, if applicable)
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 (including mobile phone coverage) and Internet services
2319 Availability of public transport: bus, train, boat; if not, travelling time to the nearest bus station, train station, dock, etc. (by season, if applicable)

Development programmes

2401 Presence of specific development projects in the community.

Concepts and definitions for community-level items

9.22 ***Location*** (Item 2101) is normally based on a geographic coding system (see paragraphs 8.1.2 - 8.1.4). This item is needed to summarize the data by geographical groupings, to relate the data to holding-level data, and to link community databases.

9.23 ***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.

9.24 ***Land use*** (Item 2103) at the community level provides a comprehensive picture of all land in the community in addition to the land operated by holdings as obtained in the holding-level collection. Land use classes should be compatible with the classification used in the holding-level collection (see paragraphs 8.2.7 - 8.2.35). Land use data at the community level may be shown in more detail, such as showing land under water or identifying different forest types.

9.25 ***Area of communal grazing land*** (Item 2104), ***area of communal forest*** (Item 2105) and ***communal area under water used for aquaculture*** (Item 2106) are part of the comprehensive land use data (Item 2103) but may be collected independently if Item 2103 is not included in the community questionnaire. Items 2104 - 2106 help to fill in the gaps from the holding-level collection.

9.26 When collecting community-level data on items 2103-2106 to complement the individual data collected from holdings, it is important to ensure that duplicate counting of data is avoided. In this respect, community-level data should specify community land area rented out to individual holdings. In order to make up aggregations for total land area by land use types, the land use classification recommended in the Chapter 8, Theme 2 should be applied (see paragraph 8.2.13).

9.27 ***Travelling time and the associated mode of travel to the nearest major urban centre*** (Item 2107). 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. There may be different modes of travel, such as walking, motor vehicle,

animal-powered vehicle, bus, bicycle, etc. The specific list of modes depends on country circumstances. If more than one mode of travel is available, then the most usual mode and travelling time associated with it should be reported. The related item ***whether the community has year-round access to the nearest urban centre by a motorable road*** (Item 2108) helps to highlight the transportation problems faced by people in the community.

9.28 Whether the community is prone to natural disasters (Item 2109) is important for countries that face regular crises because of flooding, droughts or other natural disasters. This is often a major cause of food insecurity and may influence farmers' agricultural practices. Quantitative information may be collected about the number of occurrences of various types of natural disasters during, say, the last five or ten years.

9.29 ***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.

9.30 ***Economic status*** (Item 2203). In some countries, each community is assigned an economic status measure, which can be useful to analyse holding-level characteristics with respect to whether the community is "rich" or "poor".

9.31 ***Main economic activities*** (Item 2204) should be based on the ISIC Rev. 4 (UN 2008).

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

9.33 ***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. As in case of Item 2107, if there are various modes of travelling, then travelling time under the most usual mode should be reported.

9.34 ***Presence of specific development projects in the community*** (Item 2401). This item is of interest in places 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.

CHAPTER 10
TABULATION, DISSEMINATION AND ARCHIVING

To be useful, data collected in an agricultural census must be presented in aggregated form, especially in statistical tables. This chapter is divided into two parts. The first part presents the recommended tables for the tabulation of results, identifies the most important census classification items, proposes basic cross-tabulations for the essential items and presents the main issues in the tabulation programme for the community survey as well as for the census of agriculture and aquaculture. The second part of the chapter focuses on dissemination and archiving and underlines the issue of data access as an important component of the agricultural census programme. It discusses ways to disseminate metadata, aggregated data and safe access to census microdata and shows the benefits of census data archiving.

A TABULATION

Introduction

10.1 Data collected in an agricultural census are of statistical interest if they can be presented in aggregated form. The primary form of presentation for statistical data is the statistical table. The tabulation programme for an agricultural census is the set of statistical tables prepared to present the main census results and should be based on the users' primary needs. Because of the emergence of new information and communication technologies, the way to present census data is changing rapidly. The compilation of census data has become more and more user-friendly, and Web-based data allow users to develop their own tables, making printed reports less relevant. However, three considerations remain: a) the existence of a tabulation programme is paramount for developing the census questionnaire and to ensure that all relevant census information is included; b) countries should produce some basic standard reports using a wide range of methods of dissemination and media (printed, CD-ROMs, pen drives or for the Internet) to ensure the widest dissemination of the census results; c) international comparisons require standard tables for all countries, including those for which census databases are not on the Web.

10.2 The tabulation programme for an agricultural census must be determined before designing the census questionnaires. This will ensure the data collected 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.

10.3 Statistical tables in a standard report (basic cross-tabulations) present different types of summarized measures. These may include:

- 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 the holding;
- Percentages, such as the percentage of holdings using organic fertilizers or the percentage of communities with electricity connected.

10.4 All data items collected in the census should be presented in at least one table cross-tabulated with the administrative region or agro-ecological zone.

10.5 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 areas of holdings, or the percentage of holdings using organic fertilizers for holders of different ages. Here, "area of holding" and "age of holder" are the ***classification variables***. Most censuses and surveys contain some ***main classification variables*** that are used in many tables. Often, classification variables need to be formed into suitable classes for presentation in the tables. Thus, in the above examples, age of holder needs to be grouped into suitable age classes and area of holding into suitable area classes. The most basic set of census tables presents the data for each item against a common variable such as the administrative regions of the country. It is important that data for all census items are tabulated; otherwise the user will question why the data was collected.

10.6 Often, more complex ***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 25-34 years; and (ii) area of holding is in the range 1.00-1.99 ha. There are a very large number of possible cross-tabulations and an even larger number of three-way tabulations, such as number of holdings classified by age of holder, area of holding and region. For the main census report, cross-tabulations should only be considered in very special cases and three-way tables should be avoided. Cross-tabulations and three-way tabulations are particularly useful for in-depth studies and here the analysts should have access to the public database so that they can generate their own specific set of tables.

10.7 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 in making comparisons between countries. Attention should also be given to consistency between statistical collections in the country; for example, it would be difficult to compare data if age groups 25-34, 35-44, etc. were used in one collection and age groups 20-30, 31-40, etc. were used in another. Recommended classifications for use in the agricultural census tabulation programme are presented in this chapter. In order to meet national reporting needs that do not conform to the tabulation classes listed, more disaggregate classes are encouraged. This will allow for re-aggregation to the international standards for comparison purposes. In some cases, countries may apply national units of measure, in which case additional tabulations using international units of measure and the tabulation classes in Table 1 are also needed in order to allow for international comparison. Where countries wish to use different class groupings in their standard reports, they should also report the results according to the guidelines given here for international comparison purposes.

Essential items to be tabulated in standard reports

10.8 Essential items are those items that every country should collect, regardless of the approach used, and that are imperative for national and international purposes. The breakdown of the essential item into size groups forms the tabulation classes. In some cases, a component of the item is used for the establishment of the classes; this component is called a classification variable. The tabulation classes and reference group for each essential item or variable are summarized in Table 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 by the number of a particular type of livestock they have.

10.9 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 variables for tabulations against some of the essential items such as number of holdings. This is discussed in paragraphs 10.28 - 10.32.

10.10 In some countries, economic typologies are required, such as the main agricultural activity on the holding or typologies of family farms. The typologies are not defined as part of the WCA but it should be noted that the essential items of the census are an important source of the data needed for deriving these typologies.

Table 1: Agricultural census essential items: tabulation classes

ESSENTIAL ITEM/CLASSIFICATION VARIABLE	TABULATION CLASSES	REFERENCE GROUP
Administrative unit or agro-ecological zone (From 0101 Identification and location of the holding)	Based on national groupings	All holdings
0103 Legal status of agricultural holder (type of holder)	A civil person Group of civil persons Juridical person	All holdings
0104 Sex of agricultural holder	Holder is a civil person Male Female Joint holders Holders are male only Holders are female only Holders are both male and female	Holdings in household sector
0105 Age of agricultural holder	Holder is a civil person Under 25 years 25 – 34 years 35 – 44 years 45 – 54 years 55 – 64 years 65 years and over Joint holders	Holdings in household sector
0107 Main purpose of production of the holding	Producing mainly for home consumption Producing mainly for sale	Holdings in household sector
0108 Other economic activities of the household	Support activities to agriculture and post-harvest crop activities Hunting, trapping and related service activities Forestry and logging Fishing and aquaculture Manufacturing Wholesale and retail trade, repair of motor vehicles and motorcycles Hotels and restaurants (excluding agrotourism) Agrotourism Other	Holdings in the household sector (One holding can belong to more than one class)
0201 Total area of holding	Holdings without land Holdings with land Less than 1 ha 1 – 1.99 ha 2 – 4.99 ha 5 – 9.99 ha 10 – 19.99 ha 20 – 49.99 ha 50 – 99 ha 100 – 199 ha 200 – 499 ha 500 – 999 ha 1,000 ha and over	All holdings
Land use types (from 0202 Area of holding according to land use types)	Land under temporary crops Land under temporary meadows and pastures Land temporarily fallow Land under permanent crops Land under permanent meadows and pastures Land under farm buildings and farmyards Forest or other wooded land Area used for aquaculture (including inland and coastal waters if part of the holding) Other land not elsewhere classified.	All holdings
Area of agricultural land (from 0202 Area of holding according to land use types)	Holdings without agricultural land Holdings with agricultural land (Area groupings as for area of holding)	All holdings

Table 1: Agricultural census essential items: tabulation classes

ESSENTIAL ITEM/CLASSIFICATION VARIABLE	TABULATION CLASSES	REFERENCE GROUP
Land tenure types (from 0203 Area of holding according to land tenure types)	Holdings without land Holdings operated under one tenure form Legal ownership or owner-like possession Non-legal ownership or owner-like possession Rented from someone else Other Holdings operated under two or more tenure forms	All holdings
0302 Area of land actually irrigated: fully and partially controlled irrigation	Holdings without irrigated land Holdings with land actually irrigated fully controlled irrigation partially controlled irrigation (Area groupings as for area of holding)	Holdings with land
Type of temporary crops (from 0402 Area of temporary crops harvested)	Holdings without temporary crops Holdings with temporary crops Based on crop classification in Annex 4	Holdings with land (One holding can belong to more than one class)
Type of permanent crops (from 0406 Area of productive and non-productive permanent crops in compact plantations)	Holdings without permanent crops Holdings with permanent crops Based on crop classification in Annex 4 Also classified by: Compact plantation is present Compact plantation is not present	Holdings with land (In the case of the first classification, one holding can belong to more than one class)
Presence of scattered permanent crop trees (from 0407 Number of permanent crop trees in scattered plantings)	Based on crop classification in Annex 4	Holdings with land (One holding can belong to more than one class)
0411 Use of each type of fertilizer	No use of fertilizers Use of fertilizers Mineral fertilizers Organo-mineral fertilizers Organic fertilizers Biofertilizers Manure Other organic materials to enhance plant growth	Holdings with land (One holding can belong to more than one class)
0501 Type of livestock system	Holdings without livestock Holdings with livestock Grazing system Mixed system Industrial system	All holdings
Livestock types (from 0502 Number of animals)	Holdings without livestock Holdings with livestock Based on livestock classification in Annex 6	All holdings (One holding can belong to more than one class)
0502a 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
0502b Number of buffaloes	Same as for "Number of cattle"	All holdings
0502c 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	All holdings

Table 1: Agricultural census essential items: tabulation classes

ESSENTIAL ITEM/CLASSIFICATION VARIABLE	TABULATION CLASSES	REFERENCE GROUP
0502d Number of goats	Same as for "Number of sheep"	All holdings
0502e Number of pigs	Same as for "Number of sheep"	All holdings
0502f Number of poultry	Holdings with no poultry Holdings with poultry 1 – 9 poultry 10 – 49 poultry 50 – 99 poultry 100 – 199 poultry 200 – 499 poultry 500 – 999 poultry 1,000 – 4,999 poultry 5,000 – 9,999 poultry 10,000 poultry or more	All holdings
0503 Number of female breeding animals	Holdings without livestock Holdings with livestock same classes as for number of livestock by type (0502af)	All holdings
0601 Use of agricultural pesticides	No use of agricultural pesticides Use of pesticides: Insecticides Herbicides Fungicides Rodenticides Other	All holdings (One holding can belong to more than one class)
Household size (from 0801 Household size by sex and age groups)	1 person 2 – 3 persons 4 – 5 persons 6 – 9 persons 10 persons and over	Holdings in household sector
Number of household members for whom the working on the holding is the main activity (from 0901 Whether working on the holding is the main activity)	1 person 2 – 3 persons 4 – 5 persons 6 – 9 persons 10 persons and over	Holdings in household sector
Working time on the holding by household members (from 0902 Working time on the holding)	Male No work Work Full-time work during 1-3 months in the year Full-time work during 4-6 months in the year Full-time work during 7 or more months in the year Part-time work during 1-3 months in the year Part-time work during 4-6 months in the year Part-time work during 7 or more months in the year Female groups as above	All household members of holdings in household sector
Working time on the holding by employees (from 0903 Number and working time of employees on the holding by sex)	Male Full-time work during 1-3 months in the year Full-time work during 4-6 months in the year Full-time work during 7 or more months in the year Part-time work during 1-3 months in the year Part-time work during 4-6 months in the year Part-time work during 7 or more months in the year Female groups as above	All employees in all holdings
1201 Presence of aquaculture on the holding	Aquaculture is present Aquaculture is not present	All holdings

Main classification variables

10.11 Nine main classification variables have been identified for tabulations of the essential items when the reports are produced. The nine variables are discussed in the following paragraphs. Table 1 makes reference to the essential items. The proposed classes are broader than in previous programmes and they respond to the need for international comparisons. However, countries are free to present finer classifications within the limits of classes present here.

10.12 ***Administrative unit or agro-ecological zone*** (from item 0101). The subdivision of census data into administrative units or agro-ecological zones is one of the key tabulation requirements. Holding location defines the administrative unit or agro-ecological zone. Basic cross-tabulations usually present the collected variables by administrative unit or agro-ecological zone.

10.13 ***Legal status of agricultural holder*** (type of holder) (item 0103). This provides a basis for comparative analysis of holdings operated by households, cooperatives, corporations, etc.

10.14 ***Total area of holding*** (item 0201). Area of holding is the most widely used classification variable 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, however, 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. If a different unit from hectares is used, countries should transform all areas to hectares for tabulation purposes in order to maintain international comparisons.

10.15 ***Area of agricultural land*** (from item 0202). This may be a more suitable size measure for some purposes as it directly measures the land used mainly for crop production and grazing. Other land measures, such as area of permanent crops, may also be useful classification variables. The same comment as in the previous paragraph about the use of hectares as a unit is pertinent here.

10.16 ***Number of livestock (for a particular livestock type)*** (items 0502a–0502f). 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.

10.17 ***Main purpose of production of the holding*** (item 0107). Purpose of production is a useful measure for analysing holdings according to their market orientation

10.18 ***Household size by sex and age group*** (item 0801). Household size is a useful classification variable for understanding the dependence of rural people on land and for evaluating household members as a source of labour for the holding. For tabulations on household size, some countries may wish to use equivalence scales, which take into account the demographic characteristics of households. For more information, see Handbook on Household Income Statistics (UNECE 2011)

10.19 ***Sex of agricultural holder*** (item 0104). Sex of holder is a useful measure for analysing the role of women in agriculture. Tabulating sex of holder is complicated by the existence of holders consisting of more than one person.

Table 2: Agricultural census essential items: recommended cross-tabulations

ESSENTIAL ITEM	MAIN CLASSIFICATION VARIABLE								
	Administrative unit ecological zone	Legal status of the holder (Type of holder)	Total area of holding	Area of agricultural land	No. of livestock	Purpose of production	Household size	Sex of holder	Age of holder
0101 Location of agricultural holding	..								
0103 Legal status (type of holder)	N,A,L	..	N,A		N,L				
0104 Sex of agricultural holder	N							..	
0105 Age of agricultural holder	N								..
0107 Main purpose of production of the holding	N,A,L					..	N		
0108 Other economic activities of the household	N		N		N		N		
0201 Total area of holding	N,A	N,A	..			N,A	N,A	N,A	N,A
0202 Area of holding according to land use type	N,A	N,A	N,A	..		N,A	N,A		
0203 Area of holding according to land tenure types	N,A	N,A	N,A			N,A	N,A		
0302 Area of land actually irrigated: fully and partially controlled irrigation	N,A		N,A	N,A					
0402 Area of temporary crops harvested	N,A	N,A	N,A	N,A		N,A	N,A		
0406 Area of productive and non-productive permanent crops in compact plantations	N,A	N,A	N,A	N,A		N,A	N,A		
Presence of scattered permanent crop trees	N	N	N	N			N		
(from 0407 Number of permanent crop trees in scattered plantings)	N,A	N,A	N,A	N,A		N			
0411 Use of each type of fertilizer	N,L	N,L			N,L	N,L	N,L		
0501 Type of livestock system	N,L	N,L				N,L	N,L		
0502 Number of animals	N,L	N,L				N,L	N,L		
0503 Number of female breeding animals	N,A	N,A	N,A	N,A		N,A			
0601 Use of agricultural pesticides	N		N,A		N,L				
Household size	N,A,L		N,A	N,A	N,L	N	N		
(from 0801 Household size by sex and age groups)	N		N						
Number of household members for whom the working on the holding is the main activity (from 0901 Whether working on the holding is the main activity)	N,A,L		N,A	N,A	N,L	N	N		
1201 Presence of aquaculture	N		N						

N = Number of holdings; A = Area; L = Number of livestock.

10.20 ***Age of agricultural holder*** (item 0105). This classification variable provides a way of making comparisons between young and old farmers, and studying the effects of migration from rural areas. This tabulation should be done only for holdings headed by one person.

Working time on the holding

10.21 Data on working time at holding level (items 0902 and 0903) are particularly useful for understanding the amount of work needed for different types of holdings – for example, livestock holdings or holdings with temporary crops. The tabulation classes in Table 1 allow only for tabulation of the ***number of workers*** by categories of working time. To report on the total labour input to holdings requires an ***aggregation of the total working time*** by all workers on the holding. The categories of working time for household members and employees in the essential item would need to be converted from categorical to continuous data (also called ratio data) in order to calculate the aggregate working time. There are various methods by which a quantity of working time can be calculated from the categories. The quantity of working time by the household members and employees would then be aggregated to give the total quantity of working time on the holding. Some countries derive special units of working time – for example, a unit corresponding to the work performed by one person who is occupied on an agricultural holding on a full-time basis. However, the definition of the units to be used would be decided by each country according to need. The tabulation would be the amount of aggregate working time (or the number of special units of time) by various characteristics such as sex of workers, legal status of holdings and size of holdings.

Essential items: cross-tabulations

10.22 There are a large number of possible tables that could be produced from a typical agricultural census, even for a limited number of items. Each essential item could be cross-tabulated against each main classification variable or even several main classification variables at the same time. For example, the presence of aquaculture could be tabulated by administrative unit to analyse the geographical distribution of aquaculture, or by area of holding to analyse the relationship between aquaculture and area of holding. Alternatively, the presence of aquaculture could be tabulated by administrative unit and area of holding together to analyse the relationship between aquaculture and area of holding in different parts of the country. This section presents the most common cross-tabulations of essential items. However, the variables which can be cross-tabulated are numerous and other cross-tabulations can be made according to national needs.

10.23 Generating a statistical table from an agricultural census requires specialized technical input and countries must have a realistic census tabulation programme, taking into consideration the resources available and the importance of the information in each table to be published in a standard report. 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 wary of classifying data too finely in cross-tabulations, because table cells may be based on only one or two holdings, which may breach confidentiality. This is crucial when presenting Web-based data because if appropriate precautions are not taken, users could have access to individual information (see paragraph 10.50). Also, if the census is carried out on a sample basis, census estimates based on few sample holdings will have unacceptably high sampling errors.

10.24 The most common cross-tabulations for the essential items are summarized in Table 2. The rows of Table 2 show the essential items to be tabulated in a standard report. The columns show the nine main classification variables given in paragraphs 10.11–10.19. Classification variables appear in both the rows and columns. The body of Table 2 shows the characteristic being measured in the cross-tabulation: N = Number of holdings; A = Area; L = Number of livestock. Note that essential items on working time at the holding level (items 0902 and 0903) are not included in the rows of Table 2 as they need to be converted from categorical to continuous data (see paragraph 10.21). Often the aggregated working time at the holding level is shown in the body of the table, together with N (Number of holdings), A (Area) or L (Number of livestock).

10.25 The following example illustrates the use of Table 2. Item "total area of holding" (row) is shown as being classified against classification variable "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 10.14 and 10.18; and the other showing the area of holding for each area of holding and household size class.

10.26 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.

10.27 Given that all data items collected in the census should be tabulated in at least one basic table by administrative region or agro-ecological zone, the number of additional cross-tabulations for the main census report will be limited. However, supplementary thematic reports should be considered, as should Web-based dissemination of additional cross-tabulations. The tabulation programme in Table 2 will not necessarily meet all data needs even for the essential items. Countries should prepare additional tables as needed.

Community-level data

10.28 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 variables for tabulations of census holding-level data. For the latter purpose it is crucial to be able to link each holding with its community. In many countries this is not easy because the same community can be known by different names or the community limits are not clear. The preliminary cartographic work should clarify for each census EA the community or communities to which the EA belongs. The cross-tabulation of community-level and holding data is also very important for the quality assessment of information provided in the field. For example, if in a census questionnaire it appears that the holder is a member of a farmers' association and in the community there is no farmers' association, the point should be clarified, or if the holder appears to have animals grazing in communal land and there is no communal grazing land in the community, a clarification is needed.

10.29 Some community-level data need to be formed into suitable groupings for tabulation to be presented in a standard report. 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.

Summary characteristics of communities

10.30 The primary tabulation requirement in any standard report is for data on the number, or percentage, of communities with specific community characteristics, such as availability of electricity, seasonal food shortages, or exposure to natural disasters. Tabulations may also be prepared showing the number of households or percentage of the population with certain community characteristics.

10.31 Tabulations mainly involve classifying community-level data by administrative or agro-ecological zone. Other classification variables may also be useful, depending on the data collected.

Community-level data as classification variables for holding-level data

10.32 The selection of community-level classification variables for the tabulation of holding-level data will depend on the content of the community survey. The most common holding-level data used in such tabulations are the number and area of holdings, number of households and population. Data from a recent population and housing census can also usefully be cross-tabulated with the community survey data if available in a common format. Typical community-level classification variables are:

- ***Access to urban centre***. This item is also useful for analysing 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 provide a poverty dimension to the analysis of the census data. Sometimes, "poor" is divided further into "hungry" and "not hungry" groups.
- ***Occurrence of seasonal food shortages***. This is a useful classification variable for analysing the food security aspects of agricultural holdings.
- ***Presence of a periodic or permanent agricultural produce market***. This item can be defined according to whether or not the community has a periodic or permanent agricultural produce market, or in terms of the travelling time from the community to the nearest agricultural produce market. This item is useful for analysing 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 variable for analysing 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 variable can be used to examine the constraints to improving agricultural productivity as a result of difficulties in accessing farm inputs.
- ***Access to credit institutions***. This is defined according to whether or not there is a rural bank or other credit institution in the community, or in terms of the travelling time from the community to the nearest rural financial institution. This classification variable can be especially useful for analysing credit data with regard to how easy it is to access a credit facility.
- ***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 in studying the benefits to farmers of such associations.
- ***Presence of specific development projects***. This can be a useful classification variable for examining how such projects have benefited farmers.

Other tabulations

Aquaculture

10.33 As with the census of agriculture, each item related to aquaculture should first be tabulated by administrative unit or agro-ecological zone.

10.34 Seven main classification variables are recommended for tabulations on aquaculture, 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 unit or agro-ecological zone*** (Reference group: all aquacultural holdings): as for agricultural holding tables (see paragraph 10.12).
- ***Legal status of holder*** (Reference group: all aquacultural holdings): as for agricultural holding tables (see paragraph 10.13).
- ***Area of holding*** (Reference group: all aquacultural holdings): as for agricultural holding tables (see paragraph 10.14).

- ***Area of aquaculture*** (Reference group: all aquacultural holdings). This is based on Item 1202 (see paragraph 8.12.7). The area groupings should be the same as for area of holding (see Table 1). This is useful as a measure of size of the aquacultural activities.
- ***Household size*** (Reference group: all aquacultural holdings in sector "holdings in household sector" in Item 0103): as for agricultural holding tables (see paragraph 10.18).
- ***Sex of holder*** (Reference group: all aquacultural holdings in sector "holdings in household sector" in Item 0103): as for agricultural holding tables (see paragraph 10.19).
- ***Age of holder*** (Reference group: all aquacultural holdings in sector "holdings in household sector" in Item 0103): as for agricultural holding tables (see paragraph 10.20).

10.35 A number of cross-tabulations for aquaculture can be considered, both within the aquaculture items themselves and with the agricultural holding items. Countries should determine their own priority set of cross-tabulations dependent on users' needs.

B DISSEMINATION AND ARCHIVING

10.36 Dissemination and archiving are the stages of the census process at which the census data are made available to users and long-term preservation is ensured. Meeting users' needs for data through provision of structural data on agriculture should be seen as the main purpose of the census, and ensuring access to as wide a range of data as possible is an important component which should be planned for. Increased use of census data helps to ensure that demand for the census remains high and encourages support for future censuses. The Busan Action Plan for Statistics 2011 sets, as one of its principal objectives, the promotion of open access to statistics, stating that "…making timely and reliable statistics widely available to the public as well as to policy-makers and other stakeholders increases government effectiveness and public confidence", including actions to permit full public access to statistics. Successful dissemination and archiving require that appropriate metadata is included for both macro and microdata.

10.37 Metadata provide information about one or more aspects of the data. Metadata help users to understand what the data are measuring and how they have been created. This information helps to prevent the users from misunderstanding the data and helps to promote appropriate use of the data. Metadata can also help users to understand the quality of data by providing information about the data collection process. In addition to standard metadata items, all data released should be accompanied by appropriate quality measures which can help users to better interpret the census results. Quality measures can be included as part of the metadata or elsewhere, such as in a technical report.

10.38 Various standards and procedures for metadata documentation exist. These set out appropriate structures for metadata, as well as information about the descriptions that should be included in the metadata. One widely used standard is the Data Documentation Initiative (DDI). Other standards such as the Statistical Data Metadata Exchange (SDMX) are also used.

10.39 Data dissemination and archiving of the census should ideally be incorporated into the dissemination and archiving practices of the institution. The institution's data dissemination policies, release practices, approach to user support, and standards used for data documentation and archiving should be applied. Where practices are not yet in existence the census provides an opportunity for the institution to establish these for all surveys and censuses.

Dissemination of aggregate results

10.40 A census is not complete until the information collected is made available to potential users in a form suited to their needs. The results of the census are relevant to a wide range of users. Within government, users include policy-makers at national level and local authorities covering economic growth, food security, industrial competitiveness, national accounts, environmental protection, etc. Private sector users include those wishing to establish farm infrastructures and services, investors in agriculture, etc., in addition to users in academic and research communities, civil society and special interest organizations such as farmers' organizations, nongovernmental organizations working to improve agriculture, and international

organizations. A standard dissemination plan should be developed as part of census preparation, including development of output systems, dissemination products, management of the release, and promotion and management of user support. A variety of census products can be disseminated which are tailored to meet the needs of the particular type of user. For example, policy users in government may require that the results be analysed and include basic focused summaries of key changes and problem areas relevant to the agricultural policy of interest, with accompanying graphics and appropriate analysis. On the other hand, the needs of users such as researchers may be met by providing access to as many of the detailed data tables in electronic formats as is possible. The researchers would then conduct the analysis as needed. The products should include both public use products as well as specific products for internal agency use.

10.41 Common dissemination products are a final report on the main results and a summary report of key results. For countries conducting the modular approach there should be: a report on the core module and reports for each supplementary module; a report for commercial holdings; a report on the rural community; and various thematic reports, including reports on gender. In addition, as part of the advocacy, a brochure presenting the key results can be produced. The dissemination plan should also include a technical reference report containing metadata and methodological and operative actions, the census questionnaires and the main census manuals. Consideration should be given to developing a regionally standardized reporting format to allow for easier comparison and knowledge-sharing among countries in the region.

10.42 A variety of media can be used for dissemination (including print, online and optical media). Although printed publications are often used, in order to better meet the data needs of users, data should be produced in electronic form to allow for the possibility of further analysis and wider outreach to users. Dissemination through the Internet should also be encouraged to allow for easier access by users.

10.43 The results can be published as reports for general distribution (standard reports), as tables, or by allowing for ad hoc user-generated requests for access to a database or provision of tables. When user-generated tables are possible, care must be taken to ensure that the outputs produced have been tested for statistical reliability and confidentiality. A limit may therefore be placed on which variables can be tabulated or at which geographical levels. Although a common modality for dissemination of the main results remains printed publications, a wider range of modalities should be encouraged, such as tabulations or reports in electronic format with online distribution, which would allow for broader dissemination and a greater range of use of the data. Use of electronic formats encourages greater opportunities for use of the data and further analysis by users, and is therefore encouraged wherever possible.

10.44 Value added products can also be provided, such as census maps, in printed or digital form, which can be included in the overall dissemination programme of an agricultural census. In addition to preparing maps for the census tables and reports, countries should also produce an agricultural atlas. Other forms of access to maps include Web-based mapping and GIS. These technologies allow for construction of interactive maps, such that users can generate maps that focus on various census themes, targeting specific geographies of interest, and allows linkage between maps, tables, graphs and charts for easier interpretation of data. Maps should be produced at nested levels of administrative geography, to the smallest administrative unit which can be safely released.

10.45 The presentation of census results should be an important national event. A national seminar to disseminate the main census results, along with regional dissemination seminars, is strongly suggested in order to put the census of agriculture on the national agenda through the engagement of stakeholders and public awareness. Press conferences conducted by the main authorities responsible for the census results also provide a good means for wide dissemination.

10.46 In addition to provision of statistical products, dissemination includes the promotion of data products and the management of user support to help users access and use the census products. Managing dissemination involves several activities which will need to be planned for, including preparation and updating the dissemination databases, preparation of census dissemination products, managing the release of census dissemination, promotion of census dissemination products and managing user support.

Safe access to census microdata

10.47 Microdata are data recorded on the unit of enumeration – the holding or household - when an agriculture census is conducted. Each set of information about a unit represents a microdata record.

10.48 Microdata allow users to carry out a wider range of analyses than is possible with aggregate data. Potential users include those working in government research departments and academic institutions, as well as researchers working in non-government organizations and international agencies. In order to carry out this work researchers need access to good quality statistical data. If statistical organizations have such data, they should look for ways to satisfy the demand from researchers. Otherwise there may be a tendency for researchers to attempt to collect their own data via studies and surveys.

10.49 Providing access to microdata requires that the institution balance the demands emanating from the research community with their legislated requirement to maintain the confidentiality of the information that they have collected from respondents. In order to ensure safe access to microdata, respondents' privacy and the data producers' requirements for confidentiality need to be taken into account. It may not always be possible to create a public file which can be moved to the premises of the researcher. In some cases, access to the microdata may have to be provided to the researcher by the data producers via a mediated service. If this cannot be done, then custom tabulations may be the only choice left to the researcher.

10.50 Further guidance on provision of microdata to users and considerations to be taken into account by the statistical office can be found in Providing Access to Agricultural Microdata: A Guide (Global Strategy 2014b).

10.51 Different methods of access to microdata are possible, offering different tradeoffs between the level of detail released and the protection of confidentiality. Other issues to be considered are the costs and level of organization necessary to generate and manage the various methods.

10.52 Common types of methods for safe access are:

Public Use Files (PUFs): These files (which may be from a survey or a sample of census records) undergo a rigorous statistical disclosure control (SDC) process so that the chance of re-identification of respondents is minimal.

Licensed Files: Licensed files are also anonymized but with the possibility of fewer SDC procedures being applied. This will depend on the nature of the file and the policies of the producer; thus, they may include more detail. The data producers ask the researchers to identify themselves and be explicit about the research that they are doing. They will be asked to sign a license that identifies who can have access to the file and what the conditions of use are.

Remote Access Facilities (RAFs): RAFs involve a service window provided by the data producers which allows researchers to supply the algorithm they will be using in their analysis. The researcher is provided with a synthetic file that replicates the structure and the content of the actual data sets. The researcher can then develop programs and procedures using tools such as SAS, SPSS, STATA or R. The programs can be transmitted to the data producer, who can run the job against the actual data set and vet the results for disclosure before returning the output to the user.

Data enclaves: A data enclave consists of a facility within the premises of the statistical organization to which researchers can come in order to perform their research on detailed files. These files are the most detailed files available to the researchers, other than the actual master file. Users will be expected to identify the part of the data set they are interested in and only that data subset will be made available to them. The results produced by the researcher must be vetted by a statistical organization staff member before they can be removed from the premises. Researchers must have specific goals prior to being allowed to perform the research in the data enclave.

Deemed employee: A final model for consideration is "hiring" the researcher to work with the agency as a temporary staff member. In this case the researcher would be subject to the same secrecy and ethical provisions as the regular staff members. This is generally limited to projects which assist the data producer in meeting their organization's goals and for which they do not possess the necessary skills.

Archiving

10.53 Data archiving is a means of ensuring long-term preservation of data and assists users in understanding and interpreting the data. It primarily relates to digital data. Digital data can be vulnerable to obsolescence of enabling technologies, from hardware and software used to store and access the data to physical damage rendering the technologies unusable and to loss due to the passage of time. This section provides a summary of the rationale for data archiving and its process. Appropriate considerations for data archiving policies and organizational and technological considerations for establishing a data archive are set out in International Household Survey Network (IHSN) *Working Paper 3: Principles and Good Practices for Preserving Data* (IHSN 2009).

10.54 Data archiving has several benefits. It allows the statistical institute to meet legislative requirements for preservation of data. It can help to increase investment in census data collection by ensuring that data are available in the future, thus fully utilizing the resources spent on the census. It ensures the continued access to the census data by users over long periods of time.

10.55 Data archiving involves explicitly identifying the census data to be preserved, safe storage of the data in a sustainable environment with appropriate policies and procedures, and ensuring that the archived census data can be made available over time to authorized users. A census data archive should include raw and edited microdata and macrodata, together with the appropriate metadata, census dissemination products and census tools such as computational programs, conversion tables, enumeration manuals, training manuals, supervision manuals, questionnaires, cartography, etc.

ANNEX 1

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 (EC et al., 2009). A specific system covering the food and agricultural sector has been issued by FAO (FAO 1996b) to supplement the SNA.

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 to be two establishments, corresponding to the two types of activities.

In order to group units engaged in similar activities, 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 4 (UN 2008).

ISIC provides a hierarchical classification of activities. Thus, in ISIC (Rev. 4.), the first level (Section A: Agriculture, forestry and fishing) is divided into three subdivisions: (01) Crop and animal production, hunting and related service activities; (02) Forestry and logging; and (03) Fishing and aquaculture. These divisions are then further subdivided into groups and classes corresponding to more specific activities, such growing crops and raising 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. 4) groups:

- Group 011: Growing of non-perennial crops;
- Group 012: Growing of perennial crops
- Group 013: Plant propagation
- Group 014: Animal production
- Group 015: 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. 4) as:

- Group 016: Support activities to agriculture and post-harvest crop activities

This group includes activities incidental to agricultural production and activities similar to agriculture that are not undertaken for production purposes (in the sense of harvesting agricultural products), which are done on a fee or contract basis. Also included are post-harvest crop activities, aimed at preparing agricultural

products for the primary market. 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, 013, 014 and 015) 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 five 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 considered an establishment in the agricultural industry. However, the unit is not considered the same if the agricultural production activity of the agricultural holding is a secondary activity of a non-agricultural establishment. In this case, the agricultural holding may be considered to be an establishment-like unit in the agricultural industry. For the purposes of the agricultural census, the agricultural holding is treated as 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.
- 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.

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 of the five 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 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 with another type of tenure or 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

Aquaculture data collected in the agricultural census relate to aquaculture 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 a secondary activity of the agricultural holding as part of the agricultural industry.

An aquacultural census covers aquacultural production activities, defined by ISIC (Rev. 4) as:

- Group 032: 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. 4) group 032. 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 be combined into a single field enumeration system as part of a ***census of agriculture and aquaculture***.

Other economic activities (Item 0108)

Item 0108 in the list of 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. 4.) as follows:

- Other agricultural production activities: ISIC groups 011-015.
- Support activities to agriculture and post-harvest crop activities: ISIC group 016
- Hunting, trapping and related service activities: ISIC group 017. This group, together with Agricultural services (ISIC group 016) covers the rest of ISIC Division 01 (Crop and animal production, hunting and related service activities) not included within the scope of the agricultural census.
- Forestry and logging: ISIC Division 02.
- Fishing and aquaculture: ISIC Division 03.
- Manufacturing: ISIC Divisions 10-33.
- Wholesale and retail trade; repair of motor vehicles and motorcycles: ISIC Divisions 45–47.
- Accommodation and food service activities: ISIC Division 55-56.
- Other: all other ISIC classes not covered in the above categories.

ANNEX 2

INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL ECONOMIC ACTIVITIES (ISIC[3]): SCOPE OF THE AGRICULTURAL CENSUS

ISIC Group 011: Growing of non-perennial crops

This group comprises the activity of growing non-perennial crops – i.e. plants that do not last more than two growing seasons. Included is the growing of these plants for the purpose of seed production. It consists of seven ISIC classes:

- ISIC Class 0111: Growing of cereals (except rice), leguminous crops and oil seeds
- ISIC Class 0112: Growing of rice
- ISIC Class 0113: Growing of vegetables and melons, roots and tubers
- ISIC Class 0114: Growing of sugar cane
- ISIC Class 0115: Growing of tobacco
- ISIC Class 0116: Growing of fibre crops
- ISIC Class 0119: Growing of other non-perennial crops

The following are included:

- Growing of cereals such as: wheat, grain maize, sorghum, barley, rye, oats, millet, other cereals not elsewhere classified (n.e.c.)
- Growing of leguminous crops such as: beans, broad beans, chickpeas, cowpeas, lentils, lupins, peas, pigeon peas, other leguminous crops
- Growing of oil seeds such as: soybean, groundnut, castor bean, linseed, mustard seed, niger seed, rapeseed, safflower seed, sesame seed, sunflower seed, other oil seeds
- Growing of rice (including organic farming and the growing of genetically modified rice)
- Growing of leafy or stem vegetables such as: artichokes, asparagus, cabbages, cauliflower and broccoli, lettuce and chicory, spinach, other leafy or stem vegetables
- Growing of fruit-bearing vegetables such as: cucumbers and gherkins, eggplants (aubergines), tomatoes, watermelons, cantaloupes, other melons and fruit-bearing vegetables;
- Growing of root, bulb or tuberous vegetables such as: carrots, turnips, garlic, onions (incl. shallots), leeks and other alliaceous vegetables, other root, bulb or tuberous vegetables
- Growing of mushrooms and truffles
- Growing of vegetable seeds, except beet seeds
- Growing of sugar beet
- Growing of other vegetables
- Growing of roots and tubers such as: potatoes, sweet potatoes, cassava, yams, other roots and tubers
- Growing of sugar cane
- Growing of unmanufactured tobacco
- Growing of cotton
- Growing of jute, kenaf and other textile bast fibres
- Growing of flax and true hemp

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- Growing of sisal and other textile fibre of the genus agave
- Growing of abaca, ramie and other vegetable textile fibres
- Growing of other fibre crops
- Growing of swedes, mangolds, fodder roots, clover, alfalfa, sainfoin, maize and other grasses, forage kale and similar forage products
- Growing of beet seeds (excluding sugar beet seeds) and seeds of forage plants
- Growing of flowers, including production of cut flowers and flower buds
- Growing of flower seeds
- The following are excluded:
- Growing of mushroom spawn, see 0130
- Growing of non-perennial spices, aromatic, drug and pharmaceutical crops, see 0128.

ISIC Group 012: Growing of perennial crops

This group includes the growing of perennial crops – i.e. plants that last for more than two growing seasons, either dying back after each season or growing continuously. Included is the growing of these plants for the purpose of seed production. The group consists of nine ISIC classes:

- ISIC Class 0121: Growing of grapes
- ISIC Class 0122: Growing of tropical and sub-tropical fruits
- ISIC Class 0123: Growing of citrus fruits
- ISIC Class 0124: Growing of pome fruits and stone fruits
- ISIC Class 0125: Growing of other tree and bush fruits and nuts
- ISIC Class 0126: Growing of oleaginous fruits
- ISIC Class 0127: Growing of beverage crops
- ISIC Class 0128: Growing of spices, aromatic, drug and pharmaceutical crops
- ISIC Class 0129: Growing of other perennial crops

The following are included:

- Growing of wine grapes and table grapes in vineyards
- Growing of tropical and subtropical fruits: avocados, bananas and plantains, dates, figs, mangoes, papayas, pineapples, other tropical and subtropical fruits
- Growing of citrus fruits: grapefruit and pomelo, lemons and limes, oranges, tangerines, mandarins and clementines, other citrus fruits
- Growing of pome fruits and stone fruits: apples, apricots, cherries and sour cherries, peaches and nectarines, pears and quinces, plums and sloes, other pome fruits and stone fruits
- Growing of berries: blueberries, currants, gooseberries, kiwi fruit, raspberries, strawberries, other berries
- Growing of fruit seeds
- Growing of edible nuts: almonds, cashew nuts, chestnuts, hazelnuts, pistachios, walnuts, other nuts
- Growing of other tree and bush fruits: locust beans
- Growing of oleaginous fruits: coconuts, olives, oil palms, other oleaginous fruits
- Growing of beverage crops: coffee, tea, mate, cocoa, other beverage crops
- Growing of perennial and non-perennial spices and aromatic crops: pepper (*piper spp.*), chilies and peppers (*capsicum spp.*), nutmeg, mace and cardamoms, anise, badian and fennel, cinnamon (*canella*), cloves, ginger, vanilla, hops, other spices and aromatic crops
- Growing of drug and narcotic crops
- Growing of plants used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes
- Growing of rubber trees
- Growing of Christmas trees
- Growing of trees for extraction of sap
- Growing of vegetable materials of a kind used primarily for plaiting

The following are excluded:

- Manufacture of wine, see 1102
- Growing of soybeans, groundnuts and other oil seeds, see 0111
- Gathering of tree sap or rubber-like gums in the wild, see 0230

ISIC Group 013: Plant propagation

This group includes the production of all vegetative planting materials including cuttings, suckers and seedlings for direct plant propagation or to create plant grafting stock into which selected scion is grafted for eventual planting to produce crops. It consists of the following ISIC class:

- ISIC Class 0130: Plant propagation

The following are included:

- Growing of plants for planting
- Growing of plants for ornamental purposes, including turf for transplanting
- Growing of live plants for bulbs, tubers and roots, cuttings and slips, mushroom spawn
- Operation of tree nurseries, except forest tree nurseries

The following are excluded:

- Growing of plants for the purpose of seed production, see 011 and 012
- Operation of forest tree nurseries, see 0210

ISIC Group 014: Animal production

This group includes raising (farming) and breeding of all animals, except aquatic animals. It consists of eight ISIC classes:

- ISIC Class 0141: Raising of cattle and buffaloes
- ISIC Class 0142: Raising of horses and other equines
- ISIC Class 0143: Raising of camel and camelids
- ISIC Class 0144: Raising of sheep and goats
- ISIC Class 0145: Raising of swine/pigs
- ISIC Class 0146: Raising of poultry
- ISIC Class 0149: Raising of other animals

The following are included:

- Raising and breeding of cattle and buffaloes
- Production of raw cow milk from cows or buffaloes
- Production of bovine semen
- Raising and breeding of horses (including racing horses), asses, mules or hinnies
- Raising and breeding of camels (dromedary) and camelids
- Raising and breeding of sheep and goats
- Production of raw sheep or goat milk
- Production of raw wool
- Raising and breeding of swine (pigs)
- Raising and breeding of poultry: fowls of the species *Gallus domesticus* (chickens and capons), ducks, geese, turkeys and guinea fowls
- Production of eggs
- Operation of poultry hatcheries
- Raising and breeding of semi-domesticated or other live animals: ostriches and emus, other birds (except poultry), insects, rabbits and other fur animals
- Production of fur skins, reptile or bird skins from ranching operation
- Operation of worm farms, land mollusc farms, snail farms, etc.

- Raising of silkworms, production of silkworm cocoons
- Beekeeping and production of honey and beeswax
- Raising and breeding of pet animals (except fish): cats and dogs, birds such as parakeets, hamsters, etc.
- Raising of diverse animals

The following are excluded:

- Processing of milk, see 1050
- Breeding support services, such as stud services, see 0162
- Farm animal boarding and care, see 0162
- Production of hides and skins from slaughterhouses, see 1010
- Operation of racing and riding stables, see 9319
- Sheep shearing on a fee or contract basis, see 0162
- Production of pulled wool, see 1010
- Production of feathers or down, see 1010
- Production of hides and skins originating from hunting and trapping, see 0170
- Operation of frog farms, crocodile farms, marine worm farms, see 0321, 0322
- Operation of fish farms, see 0321, 0322
- Training of pet animals, see 9609

ISIC Group 015: Mixed farming

This group includes the combined production of crops and animals without a specialized production of crops or animals. The size of the overall farming operation is not a determining factor. If either production of crops or animals in a given unit exceeds 66 percent of standard gross margins, the combined activity should not be included here, but allocated to crop or animal farming. This group consists of the following ISIC class:

- ISIC Class 0150: Mixed farming

The following are excluded:

- Mixed crop farming, see groups 011 and 012
- Mixed animal farming, see group 014

ANNEX 3

INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL ECONOMIC ACTIVITIES (ISIC[4]): AQUACULTURE

This annex is relevant to WCA 2020 if either an aquaculture module is included in the agricultural census or the agricultural and aquaculture censuses are conducted jointly.

ISIC Group 032: Aquaculture

This group includes aquaculture (or aquafarming) – i.e. the production process involving the culturing or farming (including harvesting) of aquatic organisms (fish, molluscs, crustaceans, plants, crocodiles, alligators and amphibians) using techniques designed to increase the production of the organisms in question beyond the natural capacity of the environment (for example, regular stocking, feeding and protection from predators).

Culturing/farming refers to rearing up of the above organisms to their juvenile and/or adult phase under captive conditions. In addition, aquaculture also encompasses individual, corporate or state ownership of the individual organisms throughout the rearing or culture stage, up to and including harvesting.

It consists of the following ISIC classes:

- ISIC Class 0321: Marine aquaculture
- ISIC Class 0322: Freshwater aquaculture

The following are included:

- Fish farming in seawater or freshwater, including farming of marine ornamental fish
- Fish farming in freshwater, including farming of freshwater ornamental fish
- Production of bivalve spat (oyster, mussel, etc.), lobsterlings, shrimp post-larvae, fish fry and fingerlings
- Growing of laver and other edible seaweeds
- Culture of crustaceans, bivalves, other molluscs and other aquatic animals in seawater
- Aquaculture activities in brackish waters
- Aquaculture activities in saltwater-filled tanks or reservoirs
- Operation of fish hatcheries(marine)
- Operation of fish hatcheries (freshwater)
- Operation of marine worm farms
- Culture of freshwater crustaceans, bivalves, other molluscs and other aquatic animals
- Farming of frogs

The following are excluded:

- Operation of sport fishing preserves, see 9319

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ANNEX 4
CLASSIFICATION OF CROPS

The Indicative Crop Classification (ICC 1.0) developed in the WCA 2010 round, has been revised for the 2020 round of agricultural censuses, and is given at the end of this annex as Version 1.1.

The ICC used in the 2010 agricultural census programme reflected various elements related to crops, including the growing cycle (temporary/permanent), crop genus or species (each crop can be described) and product type (provided in the structure of Central Product Classification Version 2.1).

ICC has been revised based on the Central Product Classification (CPC) Version 2.1 (UN, 2015a). 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 online 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 2.1, is being revised. ICC is based on the draft of the revised CPC, to which FAO has provided input. ICC Version1.1 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 Version 1.1, crops are first divided into groups such as cereals, vegetables, fruits, etc., and each group is further subdivided 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 7.05) 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 and oleaginous fruits" (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 division, 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 subclasses. In ICC Version 1.1, a separate code is provided to indicate whether the crop is temporary or permanent.

It should be noted as a general principle that in the ICC a particular crop is classified only once in the classification, regardless of how the crop is used.

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 subdivide the crop in the crop classification, as required. Thus, subclass 2.02.04 could be subdivided into 2.03.05.01 (Pumpkin for food) and 2.03.05.02 (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 Version 1.1:
- 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 9.01 (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 1.02), 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 fruit crops or as oil crops should be classified according to their primary use in the country. In ICC Version1.1, coconut has been shown as an oil crop (Subclass 4.04.01).
- 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 8.4.11), but could have a secondary use in production data. The crop should be classified according to its primary use in the country. For example, in ICC Version 1.1, cotton has been defined as a fibre crop (Order 9.02.01.01).

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 subclass 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 Annex 5.

Note that the different levels of ICC – namely, groups, classes, subclasses 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 may also wish to separately identify crops not shown in ICC or to show crops in more detail than is 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 1.1 (ICC)

Group	Class	Subclass	Order	Title	Crop type*
1				Cereals	T
	1.01			Wheat	T
	1.02			Maize	T
	1.03			Rice	T
	1.04			Sorghum	T
	1.05			Barley	T
	1.06			Rye	T
	1.07			Oats	T
	1.08			Millet	T
	1.09			Triticale	T
	1.10			Buckwheat	T
	1.11			Fonio	T
	1.12			Quinoa	T
	1.13			Canary seed	T
	1.14			Mixed cereals	T
	1.90			Other cereals, n.e.c.	T
2				**Vegetables and melons**	T
	2.01			Leafy or stem vegetables	T
		2.01.01		*Artichokes*	T
		2.01.02		*Asparagus*	T
		2.01.03		*Cabbages*	T
		2.01.04		*Cauliflower and broccoli*	T
		2.01.05		*Lettuce*	T
		2.01.06		*Spinach*	T
		2.01.07		*Chicory*	T
		2.01.90		*Other leafy or stem vegetables, n.e.c.*	T
	2.02			Fruit-bearing vegetables	T
		2.02.01		*Cucumbers*	T
		2.02.02		*Eggplants (aubergines)*	T
		2.02.03		*Tomatoes*	T
		2.02.04		*Pumpkin, squash and gourds*	T
		2.02.05		*Okra*	T
		2.02.90		*Other fruit-bearing vegetables, n.e.c.*	T
	2.03			Root, bulb or tuberous vegetables	T
		2.03.01		*Carrots*	T
		2.03.02		*Turnips*	T
		2.03.03		*Garlic*	T
		2.03.04		*Onions (incl. shallots)*	T
		2.03.05		*Leeks and other alliaceous vegetables*	T
		2.03.90		*Other root, bulb, or tuberous vegetables, n.e.c.*	T
	2.04			Mushrooms and truffles	T
	2.05			Melons	T
		2.05.01		*Watermelons*	T
		2.05.02		*Cantaloupes and other melons*	T
	2.90			Other vegetables n.E.C.	T

Indicative crop classification version 1.1 (ICC)

Group	Class	Subclass	Order	Title	Crop type*
3				**Fruit and nuts**	P
	3.01			Tropical and subtropical fruits	P
		3.01.01		*Avocados*	P
		3.01.02		*Bananas*	P
		3.01.03		*Plantains*	P
		3.01.04		*Dates*	P
		3.01.05		*Figs*	P
		3.01.06		*Mangoes, guavas and mangosteens*	P
		3.01.07		*Papayas*	P
		3.01.08		*Pineapples*	P
		3.01.90		*Other tropical and subtropical fruits, n.e.c.*	P
	3.02			Citrus fruits	P
		3.02.01		*Grapefruit and pomelo*	P
		3.02.02		*Lemons and limes*	P
		3.02.03		*Oranges*	P
		3.02.04		*Tangerines mandarins, clementines*	P
		3.02.90		*Other citrus fruits, n.e.c.*	P
	3.03			Grapes	P
	3.04			Berries	P
		3.04.01		*Currants*	P
		3.04.02		*Gooseberries*	P
		3.04.03		*Kiwi fruit*	P
		3.04.04		*Raspberries*	P
		3.04.05		*Strawberries*	P
		3.04.06		*Blueberries*	P
		3.04.07		*Cranberries*	P
		3.04.90		*Other berries, n.e.c*	P
	3.05			Pome fruits and stone fruits	P
		3.05.01		*Apples*	P
		3.05.02		*Apricots*	P
		3.05.03		*Cherries and sour cherries*	P
		3.05.05		*Peaches and nectarines*	P
		3.05.06		*Pears and quinces*	P
		3.05.08		*Plums and sloes*	P
		3.05.90		*Other pome fruits and stone fruits, n.e.c.*	P
	3.06			Nuts	P
		3.06.01		*Almonds*	P
		3.06.02		*Cashew nuts*	P
		3.06.03		*Chestnuts*	P
		3.06.04		*Hazelnuts*	P
		3.06.05		*Pistachios*	P
		3.06.06		*Walnuts*	P
		3.06.07		*Brazil nuts*	P
		3.06.08		*Areca nuts*	P
		3.06.09		*Cola nuts*	P
		3.06.90		*Other nuts, n.e.c.*	P
	3.90			Other fruits, n.e.c.	P

Indicative crop classification version 1.1 (ICC)

Group	Class	Subclass	Order	Title	Crop type*
4				**Oilseed crops and oleaginous fruits**	
	4.01			Soya beans	T
	4.02			Groundnuts	T
	4.03			Other temporary oilseed crops	T
		4.03.01		*Castor bean*	T
		4.03.02		*Linseed*	T
		4.03.03		*Mustard*	T
		4.03.04		*Niger seed*	T
		4.03.05		*Rapeseed*	T
		4.03.06		*Safflower*	T
		4.03.07		*Sesame*	T
		4.03.08		*Sunflower*	T
		4.03.09		*Shea tree (shea butter or karite nuts)*	T
		4.03.10		*Tung tree*	T
		4.03.11		*Jojoba*	T
		4.03.12		*Poppy*	T
		4.03.13		*Tallow tree*	T
		4.03.90		*Other temporary oilseed crops, n.e.c.*	T
	4.04			Permanent oilseed crops	P
		4.04.01		*Coconuts*	P
		4.04.02		*Olives*	P
		4.04.03		*Oil palms*	P
		4.04.90		*Other oleaginous fruits, n.e.c.*	P
5				**Root/tuber crops with high starch or inulin content**	T
	5.01			Potatoes	T
	5.02			Sweet potatoes	T
	5.03			Cassava	T
	5.04			Yams	T
	5.05			Taro	T
	5.06			Yautia	T
	5.90			Other roots and tubers, n.e.c.	T
6				**Stimulant, spice and aromatic crops**	
	6.01			Stimulant crops	P
		6.01.01		*Coffee*	P
		6.01.02		*Tea*	P
		6.01.03		*Maté*	P
		6.01.04		*Cocoa*	P
		6.01.05		*Chicory roots*	P
		6.01.90		*Other stimulant crops, n.e.c.*	P
	6.02			Spice and aromatic crops	
		6.02.01		*Temporary spice and aromatic crops*	T
			6.02.01.01	Chillies and peppers (*capsicum spp.*)	T
			6.02.01.02	Anise, badian, and fennel	T
			6.02.01.90	Other temporary spice crops, n.e.c.	T
		6.02.02		*Permanent spice and aromatic crops*	P
			6.02.02.01	Pepper (*piper spp.*)	P

Indicative crop classification version 1.1 (ICC)

Group	Class	Subclass	Order	Title	Crop type*
			6.02.02.02	Nutmeg, mace, cardamoms	P
			6.02.02.03	Cinnamon (canella)	P
			6.02.02.04	Cloves	P
			6.02.02.05	Ginger	P
			6.02.02.06	Vanilla	P
			6.02.02.07	Hops	P
			6.02.02.90	Other permanent spice and aromatic crops, n.e.c.	P
7				**Leguminous crops**	T
	7.01			Beans	T
	7.02			Broad beans	T
	7.03			Chickpeas	T
	7.04			Cowpeas	T
	7.05			Lentils	T
	7.06			Lupins	T
	7.07			Peas	T
	7.08			Pigeon peas	T
	7.09			Bambara beans	T
	7.10			Vetches	T
	7.90			Leguminous crops, n.e.c.	T
8				**Sugar crops**	**T**
	8.01			Sugar beet	T
	8.02			Sugar cane	T
	8.03			Sweet sorghum	T
	8.90			Other sugar crops, n.e.c.	T
9				**Other crops**	
	9.01			Grasses and other fodder crops	
		9.01.01		*Temporary grass and fodder crops*	T
		9.01.02		*Permanent grass and fodder crops*	P
	9.02			Fibre crops	
		9.02.01		*Temporary fibre crops*	T
			9.02.01.01	Cotton	T
			9.02.01.02	Jute, kenaf, and other similar crops	T
			9.02.01.04	Flax	T
			9.02.01.05	Hemp	T
			9.02.01.90	Other temporary fibre crops, n.e.c.	T
		9.02.02		*Permanent fibre crops*	P
			9.02.02.01	*Ramie*	P
			9.02.02.02	*Sisal*	P
			9.02.02.90	*Other permanent fibre crops, n.e.c.*	P
	9.03			Medicinal, pesticidal or similar crops	
		9.03.01		*Temporary medicinal, pesticidal or similar crops*	T
			9.03.01.01	*Mint*	T
			9.03.01.02	*Basil*	T
			9.03.01.90	*Other temporary medicinal, pesticidal or similar crops*	T
		9.03.02		*Permanent medicinal, pesticidal or similar crops*	P
			9.03.02.01	*Ginseng*	P

Indicative crop classification version 1.1 (ICC)

Group	Class	Subclass	Order	Title	Crop type*
			9.03.02.02	*Coca*	P
			9.03.02.03	*Kava*	P
			9.03.02.04	*Guarana*	P
			9.03.02.90	*Other permanent medicinal, pesticidal or similar crops*	P
	9.04			Rubber	P
	9.05			Flower crops	
		9.05.01		*Temporary flower crops*	T
		9.05.02		*Permanent flower crops*	P
	9.06			Tobacco	T
	9.90			Other crops, n.e.c.	
		9.90.01		*Other crops, n.e.c. – temporary*	T
		9.90.02		*Other crops, n.e.c. – permanent*	P

*T = temporary, P = permanent.

ANNEX 5

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Abaca (Manila hemp)	*Musa textilis*	9213	9.02.01.05	01929.05
Alfalfa for fodder	*Medicago sativa*	911	9.01.01	01912
Alfalfa for seed	*Medicago sativa*	911	9.01.01	01940
Almond	*Prunus dulcis*	361	3.06.01	01371
Angelica stems	*Angelica archangelica*	6229	6.02.02.90	01690
Anise seeds	*Pimpinella anisum*	6212	6.02.01.02	01654
Apple	*Malus sylvestris*	351	3.05.01	01351
Apricot	*Prunus armeniaca*	352	3.05.02	01343
Areca (betel nut)	*Areca catechu*	992	3.06.08	01379.01
Arracha	*Arracacia xanthorrhiza*	59	5.90	01599
Arrowroot	*Maranta arundinacea*	59	5.90	01599
Artichoke	*Cynara scolymus*	211	2.01.01	01216
Asparagus	*Asparagus officinalis*	212	2.01.02	01211
Avocado	*Persea americana*	311	3.01.01	01311
Bajra (Pearl millet)	*Pennisetum americanum*	18	1.08	0118
Bambara bean	*Voandzeia subterranea or Vigna subterranea*	79	7.09	01708
Banana	*Musa sapientum, M. cavendishii, M.nana*	3.01.02	3.01.02	01312
Barley	*Hordeum vulgare*	15	1.05	0115
Bay leaves	*Laurus nobilis,*	6229	6.02.02.90	01690
Basil	*Ocimum basilicum*	931	9.03.01.02	01690
Beans, dry, edible, for grains	*Phaseolus vulgaris*	71	7.01	01701
Beans, harvested green	*Phaseolus and Vigna spp.*	71	7.01	01701
Beet, fodder (mangel)	*Beta vulgaris*	81	8.01	01919.01
Beet, red	*Beta vulgaris*	81	8.01	01801
Beet, sugar	*Beta vulgaris*	81	8.01	01801
Beet, sugar for fodder	*Beta vulgaris*	81	8.01	01919.01
Beet, sugar for seeds	*Beta vulgaris*	81	8.01	01803
Bergamot	*Citrus bergamia*	329	3.02.90	01329
Betel nut	*Areca catechu*	992	9.90.02	01379
Black pepper	*Piper nigrum*	6221	6.02.02.01	01651
Black (bark) wattle	*Acacia mearnsii*	992	9.90.02	03250
Blackberries of various species	*Rubus spp.*	349	3.04.90	01353.02
Blueberry	*Vaccinium myrtillus; V. corymbosum*	346	3.04.06	01355.01
Brazil nut	*Bertholletia excelsa*	369	3.06.07	01377
Breadfruit	*Artocarpus altilis*	319	3.01.90	01319
Broad bean, dry	*Vicia faba*	72	7.02	01702
Broad bean, harvested green	*Vicia faba*	72	7.02	01702
Broccoli	*Brassica oleracea var. botrytis*	214	2.01.04	01213
Broom millet	*Sorghum bicolor*	18	1.08	0118
Broom sorghum	*Sorghum bicolor*	14	1.04	0114
Brussels sprouts	*Brassica oleracea var. gemmifera*	219	2.01.90	01212
Buckwheat	*Fagopyrum esculentum*	192	1.10	01192

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Cabbage (red, white, Savoy)	*Brassica oleracea var. capitata*	213	2.01.03	01212
Cabbage, Chinese	*Brassica chinensis*	213	2.01.03	01212
Cabbage, for fodder	*Brassica spp.*	213	2.01.03	01919.10
Cacao (cocoa)	*Theobroma cacao*	614	6.01.04	0164
Cantaloupe	*Cucumis melo*	225	2.02.05	01229
Caraway seeds	*Carum carvi*	6219	6.02.01.90	01654
Cardamom	*Elettaria cardamomum*	6222	6.02.02.02	01653
Cardoon	*Cynara cardunculus*	219	2.01.90	01219
Carob	*Ceratonia siliqua*	39	3.90	01391
Carrot, edible	*Daucus carota ssp. sativa*	231	2.03.01	01251
Carrot, for fodder	*Daucus carota ssp. sativa*	231	2.03.01	01919.13
Cashew nuts	*Anacardium occidentale*	362	3.06.02	01372
Cassava (manioc)	*Manihot esculenta*	53	5.03	01592
Castor bean	*Ricinus communis*	431	4.03.01	01449
Cauliflower	*Brassica oleracea var. botrytis*	214	2.01.04	01213
Celeriac	*Apium graveolens var. rapaceum*	239	2.03.90	01259
Celery	*Apium graveolens*	219	2.01.90	01290
Chayote	*Sechium edule*	229	2.02.90	01239.90
Cherry	*Prunus avium,, cerasus avium*	353	3.05.03	01344.02
Chestnut	*Castanea sativa*	363	3.06.03	01373
Chickpea (gram pea)	*Cicer arietinum*	73	7.03	01703
Chicory	*Cichorium intybus*	217	2.01.07	01214
Chicory for greens	*Cichorium intybus*	217	2.01.07	01214
Chili, dry (all varieties)	*Capsicum spp. (annuum)*	6211	6.02.01.01	01652
Chili, fresh (all varieties)	*Capsicum spp. (annuum)*	6211	6.02.01.01	01652
Cinnamon	*Cinnamomum verum*	6223	6.02.02.03	01655
Citron	*Citrus medica*	329	3.02.90	01329
Citronella	*Cymbopogon citrates/ Cymbopogon nardus*	992	9.90.02	35410.01
Clementine	*Citrus reticulata*	324	3.02.04	01324.02
Clove	*Eugenia aromatica (Syzygium aromaticum)*	6224	6.02.02.04	01656
Clover for fodder (all varieties)	*Trifolium spp.*	911	9.01.01	01919.07
Clover for seed (all varieties)	*Trifolium spp.*	911	9.01.01	01919
Coca	*Erythroxypum novogranatense, E. coca*	932	9.03.02.02	01930
Cocoa (cacao)	*Theobroma cacao*	614	6.01.04	0164
Coconut	*Cocos nucifera*	441	4.04.01	0146
Cocoyam	*Colocasia esculenta*	59	5.90	01599
Coffee	*Coffea spp.*	611	6.01.01	0161
Cola nut (all varieties)	*Cola acuminata; C. nitida; C.vera*	619	3.06.09	03230
Colza (rapeseed)	*Brassica napus*	435	4.03.05	01443
Corn (maize) for cereals	*Zea mays*	12	1.02	01121
Corn (maize) for silage	*Zea mays*	12	1.02	01121
Corn (sweet) for vegetable	*Zea mays*	12	1.02	01290
Corn for salad	*Valerianella locusta*	219	2.01.90	01219
Cotton (all varieties)	*Gossypium spp.*	9211	9.02.01.01	01921

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Cottonseed (all varieties)	*Gossypium spp.*	9211	9.02.01.01	01921
Cowpea, for grain	*Vigna unguiculata*	74	7.04	01706
Cowpea, harvested green	*Vigna unguiculata*	74	7.04	01706
Cranberry	*Vaccinium macrocarpon; V. oxycoccus*	349	3.04.07	01355.02
Cress	*Lepidium sativum*	219	2.01.90	01219
Cucumber	*Cucumis sativus*	221	2.02.01	01232
Currants (all varieties)	*Ribes spp.*	341	3.04.01	01351.02
Custard apple	*Annona reticulate*	319	3.01.90	01319
Dasheen	*Colocasia esculenta*	59	5.90	01599
Date	*Phoenix dactylifera*	313	3.01.03	01314
Dill and dill seed	*Anethum graveoles*	6229	6.02.02.90	01690
Drumstick tree	*Moringa oleifera*	6229	6.02.02.90	01690
Durra (sorghum)	*Sorghum bicolour*	14	1.04	01142
Durum wheat	*Triticum durum*	11	1.01	01111
Earth pea	*Vigna subterranea*	79	7.90	01709
Edo (eddoe)	*Xanthosoma spp.; Colocasia spp.*	59	5.90	01599
Eggplant	*Solanum melongena*	222	2.02.02	01233
Endive	*Cichorium endivia*	219	2.01.90	01214
Fennel	*Foeniculum vulgare*	219	6.02.01.02	01290
Fenugreek	*Trigonella foenum-graecum*	79	7.90	01690
Fig	*Ficus carica*	314	3.01.05	01315
Filbert (hazelnut)	*Corylus avellana*	364	3.06.04	01374
Fique	*Furcraea macrophylla*	9219	9.02.01.90	01929
Flax for fibre	*Linum usitatissimum*	9213	9.02.01.04	01929.01
Flax for oil seed (linseed)	*Linum usitatissimum*	9213	9.02.01.04	01929.01
Fonio	*Digitaria exilis; D. iburua*	192	1.11	01193
Formio (New Zealand flax)	*Phormium tenax*	9214	9.02.01.04	01929
Garlic, dry	*Allium sativum*	233	2.03.03	01252
Garlic, green	*Allium sativum*	233	2.03.03	01252
Geranium	*Pelargonium spp.; Geranium spp.*	931	9.03.01	01930
Ginger	*Zingiber officinale*	6225	6.02.02.05	01657
Ginseng	*Panax spp.*	932	9.03.02.01	01930
Gooseberry (all varieties)	*Ribes spp.*	342	3.04.02	01351.01
Gourd	*Lagenaria spp; Cucurbita spp.*	226	2.02.90	01235
Gram pea (chickpea)	*Cicer arietinum*	73	7.03	01703
Grape	*Vitis vinifera*	33	3.03	0133
Grapefruit	*Citrus paradisi*	321	3.02.01	01321
Grapes for raisins	*Vitis vinifera*	33	3.03	01330
Grapes for table use	*Vitis vinifera*	33	3.03	01330
Grapes for wine	*Vitis vinifera*	33	3.03	01330
Grass esparto	*Lygeum spartum*	991	9.90.01	01929
Grass, orchard	*Dactylis glomerata*	911	9.01.01	01919

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Grass, Sudan	*Sorghum bicolour var. Sudanense*	911	9.01.01	01919
Groundnut (peanut)	*Arachis hypogaea*	42	4.02	0142
Guarana	*Paulinia cupana*	932	9.03.02.04	01690
Guava	*Psidium guajava*	319	3.01.06	01316.02
Guinea corn (sorghum)	*Sorghum bicolor*	14	1.04	0114
Guinea pepper	*Affram*omum melegueta, piper guineense, xylopia aethiopica)	6229	6.02.02.90	01690
Hazelnut (filbert)	*Corylus avellana*	364	3.06.04	01374
Hemp fibre	*Cannabis sativa ssp. Indica*	9213	9.02.01.05	01929.02
Hemp, Manila (abaca)	*Musa textilis*	922	9.02.01.05	01929.05
Hemp, sun	*Crotalaria juncea*	9213	9.02.01.05	01922
Hempseed	*Cannabis sativa (marijuana)*	439	4.03.90	01449
Henequen	*Agave fourcroydes*	922	9.02.02	01929
Henna	*Lawsonia inermis*	911	9.01.01	03250
Hop	*Humulus lupulus*	619	6.02.02.07	01659
Horse bean	*Vicia faba*	72	7.02	01702
Horseradish	*Armoracia rusticana*	239	2.03.90	01259
Hybrid maize	*Zea mays*	12	1.02	01121
Indigo	*Indigofera tinctoria*	991	9.90.01	03250
Jasmine	*Jasminum spp.*	952	9.05.02	01620
Jerusalem artichoke	*Helianthus tuberosus*	211	2.01.01	01599
Jojoba	*Simmondsia californica or S. chinensis*	449	4.03.11	01499.03
Jowar (sorghum)	*Sorghum bicolor*	14	1.04	0114
Jute	*Corchorus spp.* (over 30 sp.)	9212	9.02.01.02	01922
Kale	*Brassica oleracea var. Acephala*	219	2.01.90	01212
Kapok	*Ceiba pentandra*	922	9.02.02	01929.07
Kava	*Piper methysticum*	932	9.03.02.03	01690
Kenaf	*Hibiscus cannabinus*	9212	9.02.01.02	01922
Kiwi fruit	*Actinidia deliciosa*	343	3.04.03	01352
Kohlrabi	*Brassica oleracea var. gongylodes*	239	2.03.90	01212
Kola nut	*see* Cola nut	619	3.06.09	01379.02
Lavender	*Lavandula spp.* (over 15 sp.)	931	9.03.01	01930
Leek	*Allium ampeloprasum; Allium porrum*	235	2.03.05	01254
Lemon	*Citrus limon*	322	3.02.02	01322
Lemon grass	*Cymbopogon citratus*	922	9.02.02	35410
Lentil	*Lens culinaris*	75	7.05	01704
Lespedeza (all varieties)	*Lespedeza spp.*	911	9.01.01	01919
Lettuce	*Lactuca sativa var. capitata*	215	2.01.05	01214
Lime, sour	*Citrus aurantifolia*	322	3.02.02	01322
Lime, sweet	*Citrus limetta*	322	3.02.02	01322

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Linseed (flax for oil seed)	*Linum usitatissimum*	432	4.03.02	01441
Liquorice	*Glycyrrhiza glabra*	931	9.03.01	01930
Litchi	*Litchi chinensis*	319	3.01.90	01319
Loquat	*Eriobotrya japonica*	359	3.05.90	01359
Lupine (all varieties)	*Lupinus spp.*	76	7.06	01709.02
Macadamia (Queensland nut)	*Macadamia spp. ternifolia*	369	3.06.90	01379
Mace	*Myristica fragrans*	6222	6.02.02.02	01653
Maguey	*Agave atrovirens*	922	9.02.02	01929
Maize (corn)	*Zea mays*	12	1.02	0112
Maize (corn) for silage	*Zea mays*	12	1.02	0112
Maize (hybrid)	*Zea mays*	12	1.02	0112
Maize, ordinary	*Zea mays*	12	1.02	0112
Mandarin	*Citrus reticulata*	324	3.02.04	01324
Mangel (fodder beet)	*Beta vulgaris*	81	8.01	01919.01
Mango	*Mangifera indica*	315	3.01.06	01316.01
Mangosteen/Mangostano	*Garcinia mangostana*	315	3.01.06	01316.03
Manioc (cassava)	*Manihot esculenta*	53	5.03	01592
Maslin (mixed cereals)	*Mixture of Triticum spp.; Secale cereale*	191	1.14	01199.02
Medlar	*Mespilus germanica*	359	3.05.90	01359
Melon (except watermelon)	*Cucumis melo*	225	2.05.02	01229
Millet broom	*Sorghum bicolor*	18	1.08	0118
Millet, bajra	*Pennisetum americanum*	18	1.08	0118
Millet, bulrush	*Pennisetum americanum*	18	1.08	0118
Millet, finger	*Eleusine coracana*	18	1.08	0118
Millet, foxtail	*Setaria italica*	18	1.08	0118
Millet, Japanese	*Echinochloa esculenta*	18	1.08	0118
Millet, pearl (bajra, bulrush)	*Pennisetum americanum*	18	1.08	0118
Millet, proso	*Panicum miliaceum*	18	1.08	0118
Mint (all varieties)	*Mentha spp.*	6219	9.03.01.01	01930
Mulberry for fruit (all varieties)	*Morus spp.*	39	3.90	01343
Mulberry for silkworms	*Morus alba*	39	3.90	01343
Mushrooms	*Agaricus spp.; Pleurotus spp.; Volvariella*	24	2.04	0127
Mustard	*Brassica nigra; Sinapis alba*	433	4.03.03	01442
Nectarine	*Prunus persica var. nectarina*	354	3.05.05	01355
New Zealand flax (formio)	*Phormium tenax*	922	9.02.01.04	01929
Niger seed	*Guizotia abyssinica*	434	4.03.04	01929
Nutmeg	*Myristica fragrans*	6222	6.02.02.02	01653
Oats, for fodder	*Avena spp.* (about 30 sp.)	17	1.07	01919.92
Oats, for grain	*Avena spp.* (about 30 sp.)	17	1.07	0117
Oil palm	*Elaeis guineensis*	443	4.04.03	01491
Okra	*Abelmoschus esculentus; Hibiscus esculentus*	229	2.02.05	01239.01
Olive	*Olea europaea*	442	4.04.02	0145

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Onion seed	*Allium cepa*	234	2.03.04	01253
Onion, dry	*Allium cepa*	234	2.03.04	01253
Onion, green	*Allium cepa*	234	2.03.04	01253
Opium	*Papaver somniferum*	931	9.03.01	01930
Orange	*Citrus sinensis*	323	3.02.03	01323
Orange, bitter	*Citrus aurantium*	323	3.02.03	01323
Ornamental plants	Various	951	9.05.01	0196
Palm palmyra	*Borassus flabellifer*	992	9.09.02	03250
Palm, kernel oil	*Elaeis guineensis*	443	4.04.03	01491.02
Palm, oil	*Elaeis guineensis*	443	4.04.03	01491.01
Palm, sago	*Metroxylon sagu*	992	9.09.02	23230
Papaya (pawpaw)	*Carica papaya*	316	3.01.07	01317
Parsnip	*Pastinaca sativa*	239	2.03.90	01259
Pea, edible dry, for grain	*Pisum sativum*	77	7.07	01705
Pea, harvested green	*Pisum sativum*	77	7.07	01705
Peach	*Prunus persica*	354	3.05.05	01355
Peanut (groundnut)	*Arachis hypogaea*	42	4.02	0142
Pear	*Pyrus communis*	355	3.05.06	01342.01
Pecan nut	*Carya illinoensis*	369	3.06.90	01379
Pepper, black	*Piper nigrum*	6221	6.02.02.01	01651
Pepper, dry	*Capsicum spp.* (over 30 sp.)	6211	6.02.01.01	01652
Persimmon	*Diospyros kaki; Diospyros virginiana*	319	3.01.90	01359.01
Pigeon pea	*Cajanus cajan*	78	7.08	01707
Pineapple	*Ananas comosus*	317	3.01.08	01318
Pistachio nut	*Pistacia vera*	365	3.06.05	01375
Plantain	*Musa paradisiaca*	312	3.01.03	01313.01
Plum	*Prunus domestica*	356	3.05.08	01356
Pomegranate	*Punica granatum*	39	3.90	01399
Pomelo	*Citrus grandis*	321	3.02.01	01321
Poppy seed	*Papaver somniferum*	439	4.03.12	01448
Poppy straw	*Papaver somniferum*	931	9.03.01.02	01930
Potato	*Solamum tuberosum*	51	5.01	0151
Potato, sweet	*Ipomoea batatas*	52	5.02	01591
Prune	*Prunus domestica*	356	3.05.08	21412
Pumpkin, edible	*Cucurbita spp.* (over 25 sp.)	226	2.02.04	01235
Pumpkin, for fodder	*Cucurbita spp.* (over 25 sp.)	226	2.02.04	01919.11
Pyrethum	*Chrysanthemum cinerariaefolium*	991	9.90.01	01930.02
Quebracho	Aspidosperma spp. (more than 3 sp.)	992	9.90.02	03250
Queensland nut	See Macadamia	369	3.06.90	01379
Quince	*Cydonia oblonga*	355	3.05.06	01342.02
Quinine	*Cinchona spp.* (more than 6 sp.)	932	9.03.02	01930
Quinoa	*Chenopodium quinoa*	192	1.12	01194

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Radish	*Raphanus sativus (inc. Cochlearia armoracia)*	239	2.03.90	01259
Ramie	*Boehmeria nivea*	922	9.02.02.01	01929.03
Rapeseed (colza)	*Brassica napus*	435	4.03.05	01443
Raspberry (all varieties)	*Rubus spp.* (over 360 sp.)	344	3.04.04	01353.01
Red beet	*Beta vulgaris*	81	8.01	01801
Redtop	*Agrostis spp.*	911	9.01.01	01919
Rhea	*Boehmeria nivea*	922	9.02.02	26190
Rhubarb	*Rheum spp.*	219	2.01.90	01219
Rice	*Oryza sativa; Oryza glaberrima*	13	1.03	0113
Rose	*Rose spp.*	952	9.05.02	01930
Rubber	*Hevea brasiliensis*	94	9.04	01950
Rutabaga (swede)	*Brassica napus var. napobrassica*	239	2.03.90	01919
Rye	*Secale cereale*	16	1.06	0116
Ryegrass seed	*Lolium spp.* (about 20 sp.)	991	9.90.01	01919.05
Safflower	*Carthamus tinctorius*	436	4.03.06	01446
Saffron	*Crocus savitus*	6229	6.02.02.90	01690
Sainfoin	*Onobrychis viciifolia*	911	9.01.01	01919
Salsify	*Tragopogon porrifolius*	239	2.03.90	01259
Sapodilla	*Achras sapota*	39	3.90	01319
Satsuma (mandarin/tangerine)	*Citrus reticulata*	324	3.02.04	01324
Scorzonera (black salsify)	*Scorzonera hispanica*	239	2.03.90	01259
Sesame	*Sesamum indicum*	437	4.03.07	01444
Shea tree (shea butter or karite nut)	*Vitellaria paradoxa* or *Butyrospermum parkii*	449	4.03.09	01499.01
Sisal	*Agave sisalana*	922	9.02.02.02	01929.04
Sorghum	*Sorghum bicolor*	14	1.04	0114
Sorghum, broom	*Sorghum bicolor*	14	1.04	0114
Sorghum, durra	*Sorghum bicolor*	14	1.04	0114
Sorghum, Guinea corn	*Sorghum bicolor*	14	1.04	0114
Sorghum, jowar	*Sorghum bicolor*	14	1.04	0114
Sorghum, sweet	*Sorghum bicolor*	183	8.03	01809
Sour cherry	*Prunus cerasus, cerasus acida*	353	3.05.03	01344.01
Soybean	*Glycine max*	41	4.01	0141
Soybean hay	*Glycine max*	41	4.01	0141
Spelt wheat	*Triticum spelta*	192		01112
Spinach	*Spinacia oleracea*	216	2.01.06	01215
Squash	*Cucurbita spp.* (over 25 sp.)	226	2.02.04	01235
Strawberry	*Fragaria spp.* (over 30 sp.)	345	3.04.05	01344
Sugar beet	*Beta vulgaris*	81	8.01	01801
Sugar beet for fodder	*Beta vulgaris*	81	8.01	01919.01
Sugar beet for seed	*Beta vulgaris*	81	8.01	01801
Sugar cane for fodder	*Saccharum officinarum*	82	8.02	01919.92
Sugar cane for sugar or alcohol	*Saccharum officinarum*	82	8.02	01802
Sugar cane for thatching	*Saccharum officinarum*	82	8.02	01802
Sunflower for fodder	*Helianthus annuus*	438	4.03.08	01919.92

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.0 Code	ICC 1.1 Code	CPC 2.1 Code
Sunflower for oil seed	*Helianthus annuus*	438	4.03.08	01445
Sunhemp	*Crotalaria juncea*	9213	9.02.01.05	01922
Swede	*Brassica napus var. napobrassica*	239	2.03.90	01919
Swede for fodder	*Brassica napus var. napobrassica*	239	2.03.90	01919.02
Sweet corn	*Zea mays*	12	1.02	01290
Sweet lime	*Citrus limetta*	322	3.02.02	01322
Sweet pepper	*Capsicum annuum*	6211	6.02.02.01	01231
Sweet potato	*Lopmoea batatas*	52	5.02	01591
Sweet sorghum	*Sorghum bicolor*	183	8.03	01809
Tallow tree	*Shorea aptera; S. stenocarpa; Sapium sebiferum; Stillingia sebifera*	449	4.03.13	01499.04
Tangerine	*Citrus reticulata*	324	3.02.04	01324.01
Tannia	*Xanthosoma sagittifolium*	59	5.90	01599
Tapioca (cassava)	*Manihot esculenta*	53	5.03	01592
Taro	*Colocasia esculenta*	59	5.05	01599
Tea	*Camellia sinensis*	612	6.01.02	0162
Tef	*Eragrostis abyssinica*	192	1.90	01199.01
Thymus	*Thymus vulgaris*	6229	6.02.02.90	01690
Timothy	*Phleum pratense*	911	9.01.01	01940
Tobacco	*Nicotiana tabacum*	96	9.06	0197
Tomato	*Lycopersicon esculentum*	223	2.02.03	01234
Trefoil	*Lotus spp.* (about 100 sp.)	991	9.90.01	01929
Triticale	Hybrid of *Triticum aestivum* and *Secale cereale*	17	1.09	01191
Tung tree	*Aleurites spp.; Fordii*	449	4.03.10	01499.02
Turmeric	*Curcuma longa*	6229	6.02.02.90	01690
Turnip, edible	*Brassica rapa*	232	2.03.02	01251
Turnip, for fodder	*Brassica rapa*	232	2.03.02	01919.12
Urena (Congo jute)	*Urena lobata*	9214	9.02.01.02	01922
Vanilla	*Vanilla planifolia*	6226	6.02.02.06	01658
Vetches	*Vicia sativa*	79	7.10	01709.01
Walnut	*Juglans spp.* (over 20 sp.), *ep. regia*	366	3.06.06	01376
Watermelon	*Citrullus lanatus*	224	2.05.01	01221
Wheat	*Triticum aestivum*	11	1.01	0111
Yam	*Dioscorea spp.* (over 120 sp.)	54	5.04	01593
Yautia	*Xanthosoma sagittifolium*	59	5.06	01599
Yerba mate	*Ilex paraguariensis*	613	6.01.03	01630

ICC 1.0 code refers to the crop codes used in WCA 2010..
ICC 1.1 code refers to the crop codes used in the current WCA 2020.
CPC 2.1 code refers to corresponding codes in Central Product Classification (CPC) Version 2.1.

ANNEX 6

Classification of livestock

Group	Class	Descriptor	Link to CPC Ver. 2.1
1	1	Bovine animals	**0211**
	11	Cattle	02111
	12	Buffaloes	02112
	19	Other bovine animals	02119
2	2	Sheep and goats	**02122-02123**
	21	Sheep	02122
	22	Goats	02123
3	3	Swine/ pigs	**02140**
4	4	Equines	**02131-02133**
	41	Horses	02131
	42	Asses	02132
	43	Mules and hinnies	02133
5	5	Camels and camelids	**02121**
	51	Camels	02121*
	52	Llamas and alpacas	02121*
	59	Other camelids	02121*
6	6	Poultry	**0215**
	61	Chickens	02151
	62	Turkeys	02152
	63	Geese	02153
	64	Ducks	02154
	65	Guinea fowls	02155
7	7	Other animals	**02129, 02191-02195, 02199***
	71	Deer, elk, reindeer and other ruminants	02129
	72	Rabbits and hares	02191
	73	Fur-bearing animals such as foxes and minks	02192*
	74	Dogs and cats	02192*
	75	Ostriches and emus	02193
	76	Other birds (e.g pigeons)	02194
	79	Other animals (e.g. primates, elephants, reptiles, zebras)	02192*, 02195, 02199*
8	8	Insects and worms	**02196, 02199***
	81	Bees	02196
	82	Silkworms	02199*
	89	Other insects and worms	02199*

* Indicates a partial link between the Census classification and CPC codes – i.e. that many livestock categories in the census are linked to one category in CPC

ANNEX 7

Classification of machinery and equipment

Group	Class	Subclass	Title	Types of machinery and equipment included	HS 2012 code
1			Manually-operated equipment	Seed/fertilizer drill	8432.30
				Transplanter	8432.30
				Thresher	8433.52
				Winnower	8437.10
				Sprayer	8424.81
				Duster	8424.81
				Hand pump or other hand irrigation devices	8413.20
2			Animal-powered equipment	Wooden plough	8432.10
				Steel plough	8432.10
				Cultivator	8432.20
				Disk harrow	8432.21
				Seed/fertilizer drill	8432.30
				Leveller	8429.20
				Animal cart	8716.10
				Animal-operated irrigation devices	84.24
3			Machine-powered equipment		
	31		Machines for general farm use	Internal combustion engine	8407
				External combustion engine	8412.80
				Electric generator	85.01
				Electric motor	85.01
				Computer used for farm management	84.70
				Other electronic equipment used for farm management	8470.90
	32		Tractors, bulldozers and other vehicles	Track-laying tractor	8701.30
				Four-wheel tractor	8701.90
				Single-axle tractor	8701.10
				Bulldozer	8429.11
				Carryall	
				Truck	8704.10-.90
				Boat	8901.20-.90; 8902
				Other vehicle	8701.90
				Trailer	8716.20
	33		Crop machinery and equipment		

Classification of machinery and equipment

Group	Class	Subclass	Title	Types of machinery and equipment included	HS 2012 code
		331	*Land preparation and planting machinery and equipment*	Power tiller	8432.10
				Plough	8432.10
				Rotary tiller	8432.10
				Rotary harrow	8432.29
				Disk harrow	8432.21
				Grain drill	8432.80
				Broadcast seeder	8432.30
				Seed/fertilizer drill	8432.30
				Cultivator	8432.29
				Planters	8432.30
				Levellers	8429.20
				Diggers	8429.51-.59
				Land plane	8432.80
				Transplanter	8432.30
		332	*Crop maintenance machinery and equipment*	Manure spreader	8432.40
				Fertilizer broadcaster	8432.40
				Sprayer	8424.81
				Duster	8424.81
				Water pump	8424.81
				Drip irrigation	8424.81
				Sprinkler irrigation	8424.81
				Sprayers and other localized irrigation devices	8424.81
				Other irrigation equipment	8424.81
		333	*Crop harvesting machinery and equipment*	Mower for grass crops	8433.10
				Hay rake	8433.30
				Hay baler	8433.40
				Forage harvester	8433.59
				Forage blower	8433.59
				Combine harvester	8433.51
				Corn picker	8433.59
				Digger, potato harvester	8433.53
				Sugar beet harvester	8433.59
				Reaper-binder	
		334	*Post-harvest machinery and equipment*	Thresher	8433.52
				Grain cleaner	8437.10
				Sorters and graders	8437.10
	34		Livestock machinery and equipment	Milking machine	8434.10
				Dairy machine	8434.20
				Milk cooler	8419.89
				Cream separator	8421.11
				Incubator	8436.20
				Beekeeping machine	8436.80
	35		Aquacultural machinery and equipment		8438.80

ANNEX 8

Correspondence between basic land use classes recommended by wca 2020 and basic seea land use classes

Classes of the SEEA land use classification			Basic land use classes recommended by WCA 2020
1.1 Agriculture	1.1.1 Land under temporary crops		LU1. Land under temporary crops*
	1.1.2 Land under temporary meadows and pastures		LU2. Land under temporary meadows and pastures
	1.1.3 Land with temporary fallow		LU3. Land temporarily fallow
	1.1.4 Land under permanent crops		LU4. Land under permanent crops**
	1.1.5 Land under permanent meadows and pastures	1.1.5.1 Cultivated	LU5. Land under permanent meadows and pastures
		1.1.5.2 Naturally grown	
	1.1.6 Land under protective cover		LU6. Land under farm buildings and farmyards***
1.2 Forestry	1.2.1 Forest land		LU7. Forest and other wooded land
	1.2.2 Other wooded land		
1.3 Land used for aquaculture			LU8. Area used for aquaculture (including inland and coastal waters if part of the holding)
2.1 Inland waters used for aquaculture or holding facilities			
3.1 Coastal waters used for aquaculture or holding facilities			
1.4 Use of built-up and related areas			LU9. Other area not elsewhere classified
1.5 Land used for maintenance and restoration of environmental functions			
2.2 Inland waters used for maintenance and restoration of environmental functions			
3.2 Coastal waters used for maintenance and restoration of environmental functions			
1.6 Other uses of land, n.e.c.			
2.3 Other uses of inland waters, n.e.c.			
3.3 Other uses of coastal waters, n.e.c.			
1.7 Land not in use			
2.4 Inland waters not in use			
3.4 Coastal waters not in use			

GLOSSARY OF TERMS

Additional items: one of the three categories of census items which are provided for countries wishing to collect more in-depth (supplementary) data on specific themes. They can be collected using either the classical or modular approach (paragraph 1.19).

Aggregated results: data grouped into classes according to various classification criteria.

Agricultural holder: civil person, group of civil persons or juridical person who makes the major decisions regarding resource use and exercises management control over the agricultural holding operation (paragraph 6.17).

Agricultural holding: 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 (paragraphs 6.2 6.14).

Agricultural land: total of cropland and permanent meadows and pastures (paragraph 8.2.35).

Agroforestry: sustainable land management system in which forest species of trees and other wooded plants are purposely grown on the same land as agricultural crops or livestock (paragraphs 8.13.12 - 8.13.13).

Aquacultural census: collection of structural data from all aquacultural production units (paragraphs 5.15 5.29).

Aquacultural holding: economic unit of aquacultural production under single management comprising all aquaculture facilities without regard to title, legal form or size (paragraphs 5.18 - 5.19).

Aquaculture: farming of aquatic organisms such as fish, crustaceans, molluscs and plants, as opposed to other forms of aquatic exploitation such as capture fisheries (paragraphs 5.17, 8.12.3 - 8.12.4).

Arable land: land used in most years for growing temporary crops (paragraph 8.2.35).

Archiving: a means of ensuring long-term preservation of data including ensuring its understandability by users (paragraph 10.53).

Associated crop: a temporary crop grown in a compact plantation of permanent crops (paragraph 8.4.15).

Biofertilizers: products containing living or dormant micro-organisms, such as bacteria and fungi, which provide nutrients to enhance plant growth (paragraph 8.4.43).

Biofuel: fuel, such as biogas or biodiesel, which is produced from renewable resources, especially plant biomass, vegetable oils or treated municipal and industrial wastes.

Census: statistical collection involving the enumeration of all units (large sample-based collections are sometmes also referred to as censuses).

Census classical approach: a census conducted as a single one-off operation in which all the census information is recorded (paragraph 4.4).

Census core module: the primary agricultural census collection in the modular approach, carried out on a complete enumeration basis to provide key structural data (paragraphs 4.6 - 4.8).

Census coverage: geographical regions of the country covered by census activities. Sometimes, countries omit certain areas of the country – such as urban areas, remote areas or areas with security problems – for operational reasons (paragraph 6.26).

Census modular approach: approach to census data collection that consists of a clearly distinguishable core module and supplementary sample-based module(s), which use information collected in the core module as the frame for the supplementary module(s) (paragraph 4.6).

Census of agriculture and aquaculture: an agricultural census and an aquacultural census conducted as a combined field enumeration system (paragraph 5.19).

Census of agriculture: statistical operation for collecting, processing and disseminating data on the structure of agriculture, covering the whole or a significant part of a country (paragraph 1.1).

Census reference day: point in time used for data collection on livestock numbers and other inventory items (paragraph 6.33).

Census reference year: period of twelve months, either a calendar year or an agricultural year, generally encompassing the various time reference dates or periods of data collection for individual census items (paragraph 6.33).

Census scope: types of agricultural production activities included in the agricultural census. 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 (paragraph 6.22).

Census supplementary module: sample-based module undertaken in the modular approach in association with the core census module to provide more in-depth data (paragraph 1.8).

Classification variables: characteristics used for the classification of data (paragraph 10.5).

Common pasture: land not belonging directly to the agricultural holding, but on which common rights apply. In general terms, common pasture is agricultural area owned by a public authority (state, parish, etc.) over which another person is entitled to exercise rights of common; these rights are generally exercisable in common with others (paragraph 8.15.11).

Community-level data: data collected at community level, such as community infrastructure and services, communal grazing land, area of communal forest, area equipped for irrigation, etc. (paragraph 9.2).

Compact plantation: plants, trees and shrubs planted in a regular and systematic manner, such as in an orchard (paragraphs 8.4.24 - 8.4.25).

Complete enumeration: collection of data from all units, rather than from just a sample of units.

Compost: organic materials of animal, plant or human origin, partially decomposed through fermentation, used to improve soil structure and provide nutrients (paragraphs 8.4.45, 8.15.35).

Computer-Assisted Personal Interview (CAPI)**:** interviewing method whereby the enumerator records responses using an electronic questionnaire on mobile devices such as personal digital assistants, tablets, laptops or smartphones (paragraph 4.41).

Computer-Assisted Self Interviewing (CASI)**:** collects data using questionnaires placed on the Internet using secure methods and completed by a knowledgeable respondent (paragraph 4.42).

Computer-Assisted Telephone Interview (CATI)**:** collects data from the holdings by telephone, with the operator located at central level reading and completing the questionnaire on the computer (paragraph 4.41).

Conservation agriculture: combination of use of crop rotations, zero or no tillage, and presence of permanent soil cover (paragraph 8.6.33).

Crop residues: straw, stubble or other plant parts leaving good mulch that remain from the previous harvest (paragraph 8.15.40).

Crop rotation: technique of growing alternating species or families of crops in a specific field in a planned pattern or sequence (paragraph 8.6.36).

Cropland: total of arable land and land under permanent crops (paragraph 8.2.35).

Cross-tabulations: tables showing statistical data classified by two different items simultaneously (paragraph 10.6).

Current agricultural statistcs: ongoing agricultural statistics on such things as production and prices, as opposed to structural data collected in the agricultural census.

Cut-off threshold: minimum size limit for inclusion of agricultural units in the census (paragraph 6.30).

Digester (biogas reactor)**:** a reactor in which animal excreta, with or without straw and/or other materials such as wood shavings, sawdust, etc., are collected and anaerobically digested in a large containment vessel or covered lagoon (paragraph 8.15.19).

Double-cropping: see *successive crops*.

Drainage: artificial removal of excess surface water or groundwater, together with dissolved substances, to enhance agricultural production (paragraphs 8.8.28 - 8.8.29).

Educational attainment: highest grade of formal education completed or attended by a person (paragraph 8.8.11).

Employee: person who holds a paid employment job (paragraph 8.9.38).

Employer: person who, working on his or her own account or with one or a few partners, holds a self-employment job and, in this capacity, has engaged on a continuous basis one or more persons to work for him/her as employees (paragraph 8.9.40).

Enterprise: economic unit of production, under single management, that independently directs and manages all the functions needed to carry out production activities (Annex 1).

Enumeration area: small geographical unit defined for census enumeration purposes (paragraph 4.26).

Essential items: items that are imperative for national purposes and international comparability, which all countries are recommended to collect, regardless of their approach to the census (paragraph 1.26).

Establishment: an enterprise or part of an enterprise situated in a single location and primarily engaged in a single type of production activity (Annex 1).

Fertilizers: 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 (paragraph 8.4.39).

Field: piece of land in a parcel separated from the rest of the parcel by easily recognizable demarcation lines, such as paths, cadastral boundaries, fences, waterways or hedges (paragraph 6.16).

Food Insecurity Experience Scale (FIES)**:** scale designed to yield a quantitative measure of the severity of a household's food insecurity condition, the latter intended as a description of the combined effect of the resource constraints people face when accessing food. The indicators resulting from the use of the FIES standard can be compared across countries and over time (paragraph 8.11.8).

Food security: see *household food security.*

Forest: land spanning more than 0.5 ha with trees higher than 5 metres and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ* (paragraph 8.2.28).

Frame items: items related primarily to the modular approach; those items collected in the core module and deemed necessary for the establishment of frames for supplementary census modules or follow-up surveys (paragraphs 1.19, 1.26).

Frame: the basis used for identifying all the statistical units to be enumerated in a statistical collection.

Genetically modified seeds: seeds possessing a combination of genetic material obtained through the use of modern biotechnology (paragraph 8.6.4).

Global Positioning System (GPS)**:** system that makes it possible to find the geographic position of a point on the earth's surface by longitude and latitude. GPS allows georeferencing of the holding, the household and the land to the appropriate administrative areas (paragraph 4.43). GPS devices enable much more rapid measurement of areas than traditional objective methods for area measurement (paragraph 4.45).

Gross cropped area: sum of areas of all temporary crops grown (paragraph 8.2.20).

Hired manager: person who manages an agricultural holding on behalf of the agricultural holder (paragraph 6.19).

Holder: see *agricultural holder*.

Holding: see *agricultural holding.*

Holdings in the household sector: holdings that are operated by household members (paragraph 8.1.7).

Holdings in the non-household sector: holdings that are in sectors other than the household sector, such as corporations and cooperatives (paragraph 8.1.8).

Household food security: situation in which 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 (paragraphs 8.11.1 - 8.11.11).

Household: arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living (paragraphs 6.5 - 6.6).

Interplanted crops: plot or field in which one crop is planted between rows of another crop (paragraph 8.4.12).

Irrigation: action of purposely providing land with water, other than rain, for improving pastures or crop production (paragraph 8.3.1 - 8.3.3).

Joint holder: person making the major decisions regarding resource use and exercising management control over the agricultural holding operations, in conjunction with another person (paragraph 6.18).

Labour force status: one of three mutually exclusive categories in which a person may appear: in employment; in unemployment; or outside the labour force (paragraph 8.9.15).

Land tenure: arrangements or rights under which the holder operates the land making up the holding (paragraphs 8.2.36 - 8.2.40).

Land under farm buildings and farmyards: surfaces occupied by operating farm buildings, buildings for animal production and farmyards (paragraph 8.2.27).

Land use classification: classification of land according to the activity undertaken on the land (paragraphs 8.2.9 - 8.2.35).

Land used for agriculture: total of "agricultural land" and "land under farm buildings and farmyards" (paragraph 8.2.35).

Legal status of the holder: juridical aspects under which an agricultural holding is operated (paragraph 8.1.6).

Liquid manure: urine from domestic animals, possibly including a small amount of excrement and/or water (paragraph 8.15.19).

Livestock: all animals, birds and insects kept or reared in captivity mainly for agricultural purposes (paragraphs 8.5.1 - 8.5.2).

Manure: fertilizer prepared from organic material (paragraph 8.4.44).

Metadata: information that helps users to understand what the data are measuring and how they have been created. This information helps to prevent users misunderstanding the data and helps to promote appropriate use of the data. Metadata can also help users to understand the quality of data by providing information about the data collection process (paragraph 10.37).

Microdata: data recorded on the unit of enumeration – the holding or household – when an agriculture census is conducted. Each set of information about a unit represents a microdata record (paragraph 10.47).

Mineral fertilizers: fertilizers prepared from inorganic materials manufactured through an industrial process (paragraph 8.4.40).

Mixed crops: more than one crop grown unsystematically in a plot or field (paragraph 8.4.13).

Net cropped area: physical area of land on which temporary crops are grown (paragraph 8.2.20).

Nursery: area where young plants, trees or vines are propagated for the purpose of transplanting (paragraph 8.4.47).

Organic agriculture: holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity (paragraphs 8.6.13 - 8.6.15).

Organic fertilizers: fertilizers prepared from processed plant or animal material and/or unprocessed mineral materials (such as lime, rock or phosphate) containing at least 5 percent combined plant nutrients (paragraph 8.4.42).

Organo-mineral fertilizers: materials obtained through blending or processing organic materials with mineral fertilizers to enhance their nutrient content and fertilizing value (paragraph 8.4.41).

Other wooded land: land spanning more than 0.5 ha² with: (i) trees higher than 5 metres and a canopy cover of 510 percent or trees able to reach these thresholds *in situ*; (ii) trees not able to reach a height of 5 metres *in situ* but with a canopy cover of more than 10 percent; or (iii) combined cover of shrubs, bushes and trees of more than 10 percent (paragraph 8.2.28).

Own-account worker: person who, working on his/her own account or with one or a few partners, holds a self-employment job, and has not engaged any employees on a continuous basis during the reference period (paragraph 8.9.41).

Own-use production work: form of work comprising production of goods and services for own final use (an unpaid form of work) (paragraph 8.9.6).

Paper and Pen Interview (PAPI): traditional interviewing method whereby enumerators interview the respondents and data is collected by the enumerators using paper questionnaires (paragraph 4.40).

Parcel: 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 (paragraphs 6.15, 8.2.41).

Permanent crops: crops with a more than one-year growing cycle (paragraph 8.2.24).

Persons in employment: persons of working age who, during the reference period, were engaged in any activity to produce goods or provide services for pay or profit (paragraph 8.9.11).

Persons in own-use production work of goods: persons of working age who, during a short reference period, performed any activity to produce goods for own final use for a cumulative total of at least one hour (paragraph 8.9.13).

Persons in unemployment: persons of working age who: (i) were not in employment; (ii) carried out activities to seek employment during a specified recent period; and (iii) were currently available to take up employment given a job opportunity (paragraph 8.9.16).

Persons outside the labour force: persons of working age who were neither in employment nor in unemployment during the reference period (paragraph 8.9.16).

Pesticides: materials intended to mitigate, control or eliminate pests in plants or animals, or to control the behaviour or physiology of pests or crops during production or storage (paragraph 8.6.2).

Plot: part or whole of a field on which a specific crop or crop mixture is cultivated (paragraph 6.16).

Population census: the total process of planning, collecting, compiling, evaluating, disseminating and analyzing demographic, economic and social data at the smallest geographical level pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country (P&R, paragraph 1.4).

Production: actual quantity of produce, after drying and processing, ready for sale or consumption (paragraph 8.4.22).

Protective cover: roof of glass, plastic or other material over a permanent structure, used for protecting crops against the weather, pests or diseases (paragraph 8.4.50).

Quality assurance: measurement of relevance, accuracy, reliability, timeliness and punctuality, accessibility and clarity, comparability and coherence of the data (paragraph 4.36).

Reference group: group of holdings to be tabulated for the item in a tabulation; for example, the item "area irrigated" is only meaningful for land holdings (paragraph 10.8).

Rural households: households living in areas designated as rural areas, usually defined by the population census (paragraph 5.46).

Sample enumeration: sampling of the whole or part of the target population for the census (paragraphs 4.29 - 4.32).

Sample survey: collection of data from a sample of units, rather than all units, as in a census.

Sampling errors: errors in statistics obtained from a sample survey because data are collected from only sample units.

Sampling frame: list of units to be sampled (paragraph 3.38).

Scattered plants: plants or trees planted in such a manner that it is not possible to estimate the area (often around the holding) (paragraph 8.4.32).

Shifting cultivation: 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 recultivated (paragraphs 8.2.49).

Single-stage sampling: sampling scheme in which the sample is selected directly from a list of units covered by the survey.

Slurry: manure in liquid form – a mixture of excrements and urine of domestic animals, possibly including water and/or a small amount of litter (paragraph 8.15.19).

Soil conservation practices: sustainable practices to prevent and reverse the degradation of soil through appropriate land use and management practices (paragraph 8.6.34).

Soil degradation: decline in soil quality caused by natural processes or, more commonly, improper use by humans (paragraphs 8.53 - 8.56).

Solid/farm manure: excrement (with or without litter) of domestic animals, possibly including a small amount of urine (paragraph 8.15.19).

Statistical unit: the basic unit for which data are collected.The statistical unit for the census of agriculture is the agricultural holding (paragraph 6.1).

Status in employment: classification of jobs held by persons, or of persons in employment (paragraph 8.9.36).

Structural data: data on the basic organizational structures of agricultural holdings that do not change quickly over time, such as farm size and land use.

Successive crops: temporary crops grown more than once on the same land in the same agricultural year (paragraphs 8.4.10 - 8.4.11).

Sustainable agricultural practices: improved agricultural practices and structural changes that increase and improve the provision of goods and services in agriculture in a sustainable manner (paragraph 8.6.1).

Table: primary form of presentation of statistical data, involving the summarizing of the results (paragraph 10.1).

Tabulation programme: for an agricultural census, the set of statistical tables prepared to present the main census results (paragraph 10.1).

Temporary crops: crops with a less than one-year growing cycle (paragraph 8.4.5).

Theme: the broad subject heading describing the content of a census supplementary module or an agricultural survey.

Tillage: any physical loosening of the soil carried out in a range of cultivation operations, either by hand or mechanized (paragraph 8.6.26).

Widened agricultural census: census collecting limited additional data on households that are not agricultural holdings, used when there are few other opportunities for data collection. It is not limited to the structure of crop and livestock production activities carried out by agricultural holding (paragraph 5.40).

REFERENCES AND FURTHER READINGS

EC, IMF, OECD, UN & WB 2009. *System of national accounts*. New York.

FAO 1982. *Estimation of crop areas and yields in agricultural statistics*. FAO Economic and Social Development Paper, No 22. Rome.

FAO 1983. *Community-level statistics*. FAO Economic and Social Development Paper, No 33. Rome.

FAO 1990. *Definition and classification of fishing gear categories*. FAO Fisheries Technical Paper 222, Rev, 1, Rome.

FAO 1996a. *Conducting agricultural censuses and surveys.* FAO Statistical Development Series 6. Rome.

FAO 1996b. *Multiple frame agricultural surveys, Vol.1.* FAO Statistical Development Series 7. Rome.

FAO 1996c. *A system of economic accounts for food and agriculture.* FAO Statistical Development Series 8. Rome.

FAO 1997. *Guidelines on the collection of structural aquaculture statistics*. FAO Statistical Development Series 5b. Rome.

FAO 1999. *Agricultural censuses and gender considerations: concepts and methodology*. Rome.

FAO 2000. *Assessment of the world food security situation*. *Suggested core indicators for monitoring food security status*. Committee on World Food Security, 26th Session. Rome. Unpublished.

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

FAO 2008. *Guide to laboratory establishment for plant nutrient analysis.* FAO Fertilizer and Plant Nutrition Bulletin 19. Rome

FAO 2009. *The state of food and agriculture. Livestock in the balance*. Rome.

FAO 2011. *Green manure/cover crops and crop rotation in Conservation Agriculture on small farms.*

FAO (Gerber *et al*.) 2013. *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities.*

FAO 2013. *The Food Insecurity Experience Scale: User Guide.*

FAO 2015. *AQUASTAT, FAO's Global Water Information System*.

FAO & UNFPA 2012. *Guidelines for linking population and housing censuses with agricultural censuses.* Special Issue of the FAO Statistical Development Series. Rome.

FAO & WHO 1999. *Joint FAO/WHO Food Standards Programme Codex Alimentarius Commission*. Report of the 30th Session of the Codex Committee on Pesticide Residues, 2025 April 1998. The Hague.

Global Strategy 2014a. *Estimating Greenhouse Gas Emissions in Agriculture - A manual to Address Data Requirements for Developing Countries.*

Global Strategy 2014b. *Providing access to agricultural microdata: A guide*.

Global Strategy 2015. *Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework.*

Haug, R.T. 1993. *The practical handbook of compost engineering*. Florida.

IHSN 2009. *Principles and good practice for preserving data*. International Household Survey Network, IHSN Working Paper No 003, December.

ILO 1993. International Classification of Status in Employment (ICSE), 1993.

ILO 2009. *Report of the conference*. 1 International Conference of Labour Statisticians, 24 November- 5 December 2008. Geneva.

ILO 2013. *Resolution concerning statistics of work, employment and labour underutilization*. 19th International Conference of Labour Statisticians, 2-11 October 2013. Geneva.

UN 2008. *International standard industrial classification of all economic activities, Revision 4*. Statistical Papers, Series M No.4/Rev.4. New York.

UN 2015a. *Central product classification (CPC) version 2.1*.New York.

UN 2015b. *Principle and recommendations for population and housing censuses, revision 3.* New York.

UN, EU, FAO, IMF, OECD & WB 2014. System of environmental and economic accounting 2012 (SEEA). New York.

UNECE 2011. *Handbook on household income statistics* (2nd ed.) Geneva.

UNESCO 2011. *International standard classification of education.* Montreal.

WB, FAO & UN 2010. *Global strategy to improve agricultural and rural statistics*. Report No. 56719-GLB.

WCO 2012. *Harmonized Commodity Description and Coding System* (HS) Edition 2012.

Guidance on the conduct of national censuses of agriculture has been provided to countries since 1930 through decennial programmes. This publication, the World Programme for the Census of Agriculture 2020 (WCA 2020), is intended to provide guidance on agricultural censuses carried out by countries in the period between 2016 and 2025.

The census of agriculture continues to play a key role in the collection of structural data on the agriculture sector. The WCA 2020 will ensure that data collected are comparable at the international level while also addressing emerging information needs of the 21st century.

Four modalities for conducting a census of agriculture are discussed: *the classical (one-off) approach*, which is still widely used; *the modular approach*, which was introduced in the WCA 2010; *the integrated census/survey modality*, involving rotating survey modules over the years between two censuses; and *the combined census modality*, which uses administrative data. The concept of 'essential' items is re-introduced and 'frame' items are now separately identified for those countries wishing to adopt the modular approach or follow-up surveys. The publication emphasizes the benefits of the developments in information technology for census data collection, processing and dissemination.

Key features introduced in the previous programme are retained, namely the close relationship between the population and housing census and the agriculture census, the possibility of collecting community-level data on the infrastructure and services available to agricultural holdings, and the collection of sex-disaggregated data in the agricultural census. The new programme also provides a revised list of themes and data items to better address emerging data needs, including two new themes: "Fisheries" and "Environment/Greenhouse Gases". Countries are encouraged to evaluate the use of advanced technologies in planning their census, with a particular focus on data quality issues, timeliness and user-friendly dissemination.

The WCA 2020 has been envisaged in two volumes to clearly separate two distinct aspects of the census. The current publication, which constitutes Volume 1, focuses on describing the census programme and its concepts and definitions. Volume 2 will focus on the operational aspects of conducting agricultural censuses.

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