Food and Agriculture Organization of the United Nations

FAO STATISTICAL DEVELOPMENT SERIES 20

Master Draft March 2025

World Programme for the Census of Agriculture 2030

Programme, Concepts and Definitions

FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS
Rome, 2026

Table of Contents

ACRONYMS 6
EXECUTIVE SUMMARY 8

PART ONE: THE CENSUS OF AGRICULTURE IN CONTEXT 8

CHAPTER 1 INTRODUCTION 10
What is a census of agriculture? 10
Background to the World Programme for the Census of Agriculture 10
Objectives of the census of agriculture 12
The census and the programme of agricultural surveys 12
Main features of WCA 2030 14
Statistical unit, concepts, content, and classifications in WCA 2030 15

CHAPTER 2 IMPORTANCE OF THE CENSUS OF AGRICULTURE AND ITS INTERNATIONAL CONTEXT 19
Introduction 19
Stakeholders' needs 19
Agricultural planning, policy-making and policy monitoring 19
Research, investment and business decisions 20
Food security 21
Work in agriculture 21
Agriculture and the environment 22
The role of gender in agriculture 22
Baseline data for monitoring and evaluation 19
Statistical needs 19
Source of structural data including data for Economic Agricultural Accounts and National Accounts 23
Holding-level data 24
Advantage over the reporting system 24
Benchmarking data for agriculture statistics 24
Frames for agriculture statistics surveys 25
The statistical farm register 25
Data on agriculture structure in the small administrative units 26
Data on rare events 26
Integrating census data with geospatial data 27
Global Strategy to Improve Agricultural and Rural Statistics 27
The 50x2030 initiative to close the agricultural data gap 28
The Cape Town Global Action Plan for Sustainable Development Data 28
The 2030 Agenda and the Sustainable Development Goals 29

CHAPTER 3 RELATIONSHIP TO OTHER CENSUSES 31
Introduction 31
A. Relationship with the population and housing census 31
Agriculture in the household sector 31
Statistical units in the agricultural and population censuses 32
Options for coordinating the agriculture and the population and housing censuses 32
Using existing topics from the population census 33
Adding screening items in the population and housing census for collecting agricultural data 34
An agriculture module in the population and housing census ahead of an agricultural census 35
The core module of the agricultural census in the population and housing census 35

The two censuses as a joint operation 36
B.Combining the census of agriculture with the census of aquaculture 36
Scope of the aquacultural census 36
Statistical unit for the aquacultural census 37
Methodology for a census of agriculture and aquaculture 37
C.Relationship with economic census 38
D.Forestry module 39
E.Fisheries module 40

PART TWO: THE WORLD PROGRAMME FOR THE CENSUS OF AGRICULTURE 2030 42

CHAPTER 4 CONCEPTS AND DEFINITIONS 42
Statistical units 42
The agricultural holding 42
The household 42
Parcel, field and plot 44
Agricultural holder 45
Scope of the census of agriculture 45
Coverage of the census of agriculture 46
Cut-off threshold 46
Reference period 47
Timing of the census of agriculture 47
Content of the agricultural census 48
Steps in developing the census of agriculture 50

CHAPTER 5 METHODOLOGICAL CONSIDERATIONS 51
Introduction 51
The classical approach 52
The modular approach 53
Use of registers and administrative records as a source of census data 54
Frames for the agricultural census 55
Sampling for census modules 56
Quality assurance 57
Methods of enumeration 57
Interviewing methods 57
Complementary tools to data collection 59
Georeferencing 60
Use of geospatial data to enhance census design and data collection 60
Georeferencing and EO data 62
Estimating holding area using georeferenced data 62
EO and the enhancement of census statistics 63

CHAPTER 6 LIST OF ITEMS FOR THE CENSUS OF AGRICULTURE 65
Introduction and changes from the earlier programme 65
Essential items 66
Additional items 66
Items for consideration by theme 68
Community-level items 73

CHAPTER 7 DESCRIPTION OF ESSENTIAL ITEMS 75
Introduction 75
Theme 1: Identification and general characteristics 75
Theme 2: Land 79
Theme 3: Irrigation 87

Theme 4: Crops....88
Theme 5: Livestock....91
Theme 6: Agricultural practices....93
Theme 7: Services for agriculture ***(see Annex 4)***....95
Theme 8**:** Demographic and social characteristics ***(See Annex 4)***....95
Theme 9: Work on the holding....95
Theme 10: Aquaculture....99
Theme 11: Forestry....100
Theme 12: Fisheries....100

CHAPTER 8 COMMUNITY-LEVEL DATA....101
Introduction....101
Methodological considerations....102
Defining a community as a statistical unit for community-level data collection....102
Data collection....102
Community-level items....103
Concepts and definitions for selected community-level items....105

CHAPTER 9 TABULATION....107
Introduction....107
Essential items to be tabulated in standard reports....109
Main classification variables....114
Working time on the holding....116
Essential items: cross-tabulations....117
Community-level data....118
Summary characteristics of communities....118
Community-level data as classification variables for holding-level data....119
Other tabulations....120
Aquaculture....120

CHAPTER 10 DATA DISSEMINATION, DATA CONFLICTS AND ARCHIVING....121
Introduction....121
Dissemination of aggregate results....121
Safe access to census microdata....123
Promoting statistics through contemporary media and tools....124
Data conflicts....124
Data archiving....125

ANNEXES....127
ANNEX 1 The agricultural census within the framework of the system of national accounts....127
ANNEX 2 International standard industrial classification of all economic activities (ISIC): scope of the agricultural census....130
ANNEX 3 International standard industrial classification of all economic activities (ISIC): aquaculture....132
ANNEX 4 Additional Items of WCA 2030....133
ANNEX 5 Correspondence between WCA 2030, FAO and SEEA land use classes....172
ANNEX 6 Classification of crops....173
ANNEX 7 Alphabetic list of crops with botanical name and crop code (ICC and CPC)....179
ANNEX 8 Classification of livestock....192
ANNEX 9 Classification of machinery and equipment....193
ANNEX 10 Overview of ILO Resolutions concerning statistics of work....196

ANNEX 11 SDG Indicators covered partially by Agricultural Censuses 200

GLOSSARY OF TERMS 202
REFERENCES AND FURTHER READINGS 208

TABLES:

Table 1.1 List of items that changed themes in WCA 2030
Table 1.2 List of themes and items omitted in WCA 2030
Table 3.1 Possible relationships between the Population and Housing Census (PHC) and Agricultural Census (AC)
Table 3.2 A forestry module in the census of agriculture
Table 3.3 A fisheries module in the census of agriculture
Table 9.1 Agricultural census essential items: tabulation classes
Table 9.2 Agricultural census essential items: recommended cross-tabulations

FIGURES:

Figure 1.1 The census and the programme of agricultural surveys
Figure 1.2 Phases and steps in developing and conducting the census of agriculture
Figure 5.1 An illustration of the modular approach – core and supplementary modules
Figure 6.1 Decision tree for determining if an item is relevant for the census of agriculture
Figure 7.1 Classification of land use (LU) for the agricultural census
Figure 7.2 Correspondence between types of labour inputs and work on the holding's items

ACRONYMS

AC	Agricultural Census
AFCAS	African Commission on Agricultural Statistics
AGRIS	Agriculture Integrated Survey
APCAS	Asia and Pacific Commission on Agricultural Statistics
ASS	Agriculture Structure Survey
CAADP	Comprehensive African Agricultural Development Programme
CAPI	Computer-Assisted Personal Interview
CATI	Computer-Assisted Telephone Interview
CAWI	Computer-Assisted Web Interviewing
CPC	Central Product Classification
CTGAP	Cape Town Global Action Plan
DCMI	Dublin Core Metadata Initiative
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
IFAD	International Fund for Agricultural Development
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
SDG	Sustainable Development Goals
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
SEEA- AFF	System of Environmental-Economic Accounting for Agriculture, Forestry and Fisheries
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

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. The World Programme for the Census of Agriculture (WCA) 2030 provides updated guidelines to countries for the conduct of agricultural censuses in the 2030 census round, which covers the period between 2026 and 2035. It is the eleventh round in the decennial programme of agricultural censuses, which started in 1930.

The WCA 2030 recommends that the census should be conducted at least once every ten years by complete enumeration, focusing only on structural items. The census should be complemented by regular surveys in the inter-censal period, using the census as an input to develop the frame and focusing on non-structural fast-changing items.

It is recognized that countries employ a variety of census methodological approaches tailored to their specific circumstances, development levels, and needs. A review of experiences and lessons learned from the 2020 census round revealed that the census of agriculture can be conducted in numerous ways. This publication discusses three modalities for conducting an agricultural census: *the classical (one-off) approach*, which remains widely used; *the modular approach*, introduced in the WCA 2010; and *the combined census modality*, which incorporates administrative data and is gaining popularity.

The WCA 2030 maintains the notion of "essential" items and "additional" items. It is recommended that all countries collect all the essential items regardless of the census modality. The "additional" items are presented mainly for possible inclusion in a sample-based long questionnaire (short-long concept under the classical approach) or in sample-based modules (modular approach). These are provided for countries wishing to collect more in-depth (supplementary) data on specific themes where detailed information at the smallest administrative level is not critical.

The new WCA 2030 programme retains key features introduced in the previous programme, namely the close relationship between the population and housing census and the agriculture census (mainly for creating frames), 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 the latter, the WCA 2030 has modified the approach for assessing gender roles within the holding. The new programme also provides a revised list of themes and data items to better address emerging data needs and lessons learned from the WCA 2020.

There is an increased use of information technology in data collection, processing and dissemination. The publication emphasizes the increasing use of technology in census operations such as georeferencing, computer-assisted personal interviewing (CAPI), and computer-assisted web interviewing (CAWI), Earth Observations, Artificial Intelligence, and their potential to lead to improvements in data quality and reduce the time lag between data collection and its analysis and dissemination. Similarly, the use of interactive outputs and web-based data (tables, graphs, maps), along with access to anonymized micro-data, has opened new avenues for census dissemination. User-friendly dissemination tools not only support informed decision-making but also unleash the analytical creativity of users, thereby enhancing the value of census data for agricultural policy, research and business, beyond the traditional statistical uses. The focus of the WCA 2030 is on concepts, definitions, and methodology. When operational aspects such as planning, implementation, use of resources and quality assurance are mentioned, the reader will be referred to the "Operational guidelines" (FAO, 2018a) for further information.

Countries are expected to adopt the WCA 2030 guidelines for conducting their national census of agriculture. Adherence to the proposed standards, concepts and definitions will ensure the international comparability of the collected data, enabling countries to benchmark their performance against others. Furthermore, adopting the guidelines will assist countries in developing an integrated census and survey programme, employing innovative and cost-effective methodologies, and expanding the dissemination of census data to support informed strategic decision-making.

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 2030 (WCA 2030). The discussion summarizes the main features and changes in earlier agricultural census programmes. The objectives of the agricultural census are then presented. The discussion draws attention to the critical importance of the integration of the census of agriculture into the overall system of agricultural statistics. The chapter ends by highlighting the main features and changes in the WCA 2030.

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. A census of agriculture normally involves collecting key structural data by complete enumeration of all agricultural holdings, sometimes in combination with the collection of more detailed data using sampling methods. A complete enumeration ensures the preparation of adequate frames for inter-censal surveys, including frames for rare crops or livestock species, the provision of data for small administrative units, and benchmarks to improve current crop and livestock statistics.

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) 2030, covering agricultural censuses to be carried out by countries between 2026 and 2035. It is the eleventh 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 eight subsequent rounds – in 1950, 1960, 1970, 1980, 1990, 2000, 2010 and 2020 – 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 (IIA, 1939). 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. Furthermore, the Second World War interfered with the full implementation of the WCA 1940.

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 (FAO, 1948). Later rounds retained this focus on structural data, but gradually expanded the census content to reflect current areas of concern. The 1950 programme also gave increased attention to the definitions of census items and introduced a minimum set of tabulations of internationally comparable results.

1.5 The WCA 1960 introduced the use of sampling methods in census, which increased the number

of countries participating in the census round (FAO, 1957). Census items were grouped into ten sections according to the subject matter and the relationship between the agricultural and the population censuses was raised for the first time. The programme also expanded the tabulations of internationally comparable results to more items.

1.6 The WCA 1970 discussed the role of the census of agriculture in the overall system of agricultural statistics, in terms of frame for sample surveys and benchmark for current agricultural statistics (FAO, 1965). The programme discussed pilot censuses and pre-testing surveys. The WCA 1970 introduced an entirely new section dealing with the association of agricultural holdings with other industries.

1.7 The WCA 1980 recommended that the census of agriculture should be the basis for the collection of current agricultural data through improved methods and that concepts, definitions and methods should be harmonized with other related statistical systems and operations (FAO, 1976). The WCA 1980 was the first to indicate explicitly that it referred to national censuses conducted within the decade (1976-1985) centred on the reference year of the round (1980). A supplementary publication 'Taking agricultural censuses' (FAO, 1978) provided practical guidelines on the preparation and organization of a census of agriculture.

1.8 The WCA 1990 made further efforts in harmonizing concepts, definitions and classifications with those used in other data sources (FAO, 1986). It did not recommend the inclusion of production and input quantities in the census scope. The programme encouraged a complementary relationship between the census of agriculture and intermediate sample surveys.

1.9 The WCA 2000 recommended the activities covered by the census of agriculture be according to the International Standard Industrial Classification (ISIC), third edition, groups 011 (crops), 012 (animals) and 013 (crops and animals) (FAO, 1995). The programme also introduced the issues of census results disaggregated by sex, aquaculture holdings, and some items on the environment. The requirement to undertake censuses in all countries in the same year was also relaxed. The WCA 2000 included a supplementary publication 'Conducting agricultural censuses and surveys' (FAO, 1996a) on the steps involved in actually implementing a census of agriculture. It was an updated edition of a similar publication launched in the WCA 1980.

1.10 The WCA 2010 introduced the modular approach to help countries meet the need for a wider range of data from the agricultural census, while minimizing the cost of census-taking (FAO, 2005a). This approach consisted of a core module carried out on a complete enumeration basis to provide key structural data, in conjunction with sample-based census supplementary modules to provide more detailed structural data or data not required at lower administrative levels The census items were designated as core module items and complemented by items in the supplementary modules. The WCA 2010 also introduced the concept of aquacultural unit (for countries wishing to include an aquacultural supplementary module) and the option to conduct an aquacultural census in conjunction with the census of agriculture. Two new concepts – the sub-holding and the sub-holder – were introduced to measure the role of women. The programme introduced a community survey for obtaining data on common infrastructure issues affecting farmers. Finally, the programme reemphasised the integration and coordination of the agricultural and population censuses.

1.11 The WCA 2020 programme discussed four methodological modalities for conducting a census of agriculture: the classical (one-off) approach; the modular approach, which was introduced in the WCA 2010; the integrated census/survey modality, involving rotating survey modules over the inter-census years; and the combined census modality, which uses administrative data (FAO, 2015a). The programme made a clear distinction between ‘essential’ items and ‘frame’ items. Other items, referred to as ‘additional’ items, were deemed as optional. The WCA 2020 improved the approach for assessing the distribution of managerial decisions in the holding, useful for sex-disaggregated data, replacing the concepts of sub-holding and sub-holder. The programme included two new optional themes: “Fisheries” (capture fisheries activities conducted at household level) and “Environment/Green House Gases (GHG)” (basic agro-environmental data on GHG and ammonia emissions). Two other features of the WCA 2020 were, first, an increased emphasis on the use of information technology in data collection, processing and dissemination (e.g. CAPI, CAWI, the use of interactive online outputs and access to anonymised micro-data). Another feature was recommendations to ensure cost-effectiveness of the census of agriculture.

The WCA 2020 was complemented by 'Operational Guidelines' (FAO, 2018a), which provided practical guidance on the main stages involved in the preparation and implementation of the census of agriculture. It was an updated version of a similar publication launched in the WCA 2000. The 'Operational Guidelines' was made user-friendly with the provision of country practices and additional resources through hyperlinks.

Objectives of the census of agriculture

1.12 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 the programme of 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.

1.13 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 (See paragraph 1.1). Agricultural censuses have not normally included data that change from year to year, such as agricultural production or agricultural prices.

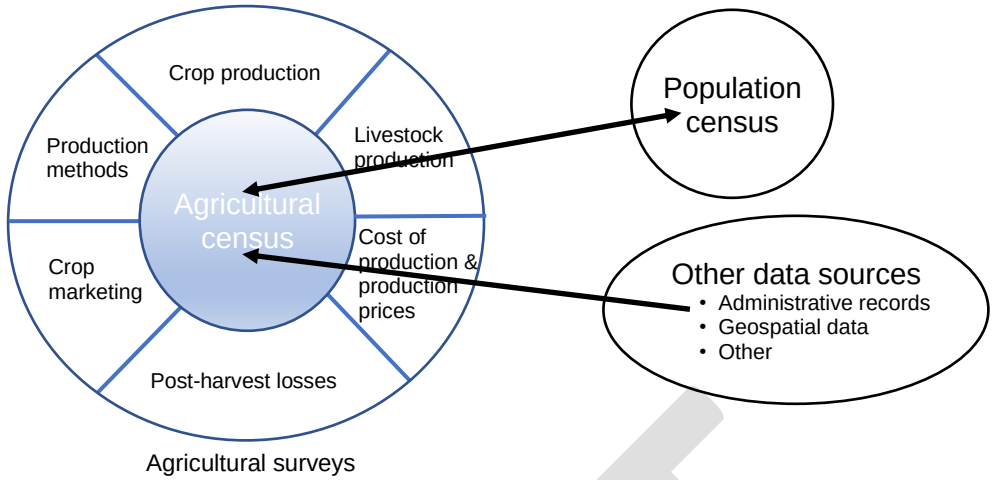
1.14 The basic objectives of the census of agriculture have remained relevant over the past few agricultural census rounds. For WCA 2030, the objectives of the agricultural census are:

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

The census and the programme of agricultural surveys

1.15 A national agricultural statistics system encompasses several elements, including the census of agriculture and the programme of agricultural surveys with the census at the core, supported by the census of population (e.g. frame of households involved in agriculture), and relevant administrative records, geospatial data and other types of data (see figure 1.1.). Efforts continue to be made towards achieving better coordination and integration of these statistical activities. Integration, in a statistical sense, means that the census and the programme of agricultural surveys are carefully planned and not carried out in isolation. The Strategic Plan for the Development of Agricultural and Rural Statistics (SPARS) seeks for the integration of agricultural census and surveys in the agricultural statistics system (see paragraph 2.57).

Figure 1.1. The census and the programme of agricultural surveys



1.16 The implementation plan involves a multiyear programme of statistical activities, in which the census is undertaken at least once every ten years, and the programme of agricultural surveys is implemented in the inter-censal period. Each statistical activity plays a specific role and serves a distinct objective of the national agricultural statistics system. Countries should plan the programme of agricultural surveys prior to the agricultural census, to ensure that the census meets the frame needs of the programme. The data requirements for food and agriculture statistics are extensive and include information on the structure of agricultural holdings (such as land use, crop and holding areas or number of livestock), agricultural production, farm management, agricultural inputs, food consumption, household income and expenditure, labour force and agricultural prices. Slow-changing structural data could come from agricultural censuses, administrative records, and geospatial data, while fast-changing non-structural data could come from agricultural sample surveys, reporting systems or other sources.

1.17 Thus, the census should be conducted at least once every decennial by complete enumeration, focusing only on structural items, while regular inter-censal sample surveys should use the census frame to complement the structural data from the census by collecting current and more detailed operational and performance holding-level data (e.g., crop and livestock production, production prices, food consumption, crop losses, farm labour data).

1.18 The census of agriculture and the programme of agricultural surveys are integrated when the multiyear programme of statistical activities is well coordinated and each element is geared to provide the most appropriate data, avoiding duplication of data collection.

1.19 The main advantages of an integrated programme are:

- It is possible to plan and develop a comprehensive programme of statistical activities without duplication 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.

1.20 Planning and implementing a coordinated and integrated census and survey programme 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 could be responsible for the agricultural census, whereas the ongoing agricultural surveys could be 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.

1.21 Many countries experience a shortage of trained statistical personnel and/or insufficient funds for statistical development and will require time to achieve an integrated census and survey programme. 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.

Main features of WCA 2030

1.22 The WCA 2030 "Programme, Concepts and Definitions" presents the methodological and conceptual aspects for implementation of agricultural censuses between 2026 and 2035.

1.23 The programme emphasizes the integration of the agricultural census within the overall framework of the system of integrated agricultural censuses and surveys. 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 2030 features discussion of three 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 for the first time in the 2010 Programme as a cost-effective approach to collecting a wider set of data. The third modality, introduced in the WCA 2020, is the combination of any of the above approaches with the use of administrative data. The "integrated census/survey modality" has been excluded from the present Programme to clearly distinguish the census from an agriculture structure survey (see paragraph 5.6).

1.24 The WCA 2030 maintains the notions of essential and additional items introduced by the previous Programme. Essential items are the minimum set of structural items that all countries should collect through complete enumeration, regardless of their approach to the agricultural census. These items are needed for national purposes and international comparison. Additional items are provided for countries wishing to collect in the census, preferably on a sample basis (e.g. in supplementary modules of the modular approach or in a long questionnaire), more in-depth data on specific themes for which detailed estimates at the smallest administrative level are not critical.

1.25 Even though it is recommended that census additional items be collected on a sample basis through census modules or a long questionnaire, some flexibility could be exercised with their collection by complete enumeration. It is important to note that, by definition, all essential items are structural, but the reciprocal is not true. In fact, some countries may find that in their context some additional items can be considered structural items because they are important for national comparison purposes (see Figure 6.1 in Chapter 6). For non-structural items, countries could refer to AGRISurvey (FAO, 2025a) concerning definitions and possible implementation approaches (see paragraphs 2.56-2.59). It must be stressed the need of maintaining additional items in the census questionnaire to a minimum to avoid burdening respondents and unnecessary overloading of the questionnaires. At this respect, each additional item should be incorporated only after a careful consideration of its utility (in particular, for creating sampling frames for supplementary modules or follow up surveys), impossibility to be collected by other mechanisms, and additional cost of collection. The programme includes some new items and changes to cover the data needs expressed by countries and users (see paragraph 1.34).

1.26 Unlike the WCA 2020 that suggested a list of possible "frame" items, the WCA 2030 acknowledges that, depending on country's needs, some items, both essential and additional, could also be used for creating frames for sample-based census supplementary modules, the continuous programme of surveys, or ad hoc and specific surveys. They should be collected through complete enumeration. In particular, in the modular approach, the core module should contain all essential items and also the additional items needed for building sampling frames for the supplementary modules. For example, a precondition for a supplementary module on Forestry, the additional item 1101 (Presence of woodland on the holding) should be included in the core module on a complete enumeration basis to build a sampling frame for the supplementary module. The essential and additional items that could be useful for building frames are highlighted in the description of items in Chapter 7 for essential items and Annex 4 for additional items.

1.27 The WCA 2030 also places continued emphasis on leveraging information technology throughout the data collection, processing, and dissemination processes. The increasing integration of technology

into census and survey operations brings about significant operational efficiencies and reduces the time lag between data collection and analysis. This technological integration encompasses various methods such as computer-assisted personal interviewing (CAPI), computer-assisted web interviewing (CAWI), internet-based data collection techniques, geo-referencing, geospatial data (e.g., Earth Observations), and artificial intelligence. Furthermore, it entails utilizing interactive outputs and web-based data presentation tools, including tables, graphs, and maps, as well as providing access to anonymized micro-data. These advancements have expanded avenues for disseminating census data. The introduction of novel and user-friendly dissemination tools not only supports informed decision-making but also encourages users to explore and analyse the data creatively, contributing to the sustained integration of agriculture statistics into the broader national statistical system.

1.28 The programme has retained three key features introduced in previous programmes. Firstly, the relationship between the population and housing census and the agriculture census. The integration of these two operations is further elaborated in a joint publication by FAO and the United Nations Population Fund "Guidelines for linking population and housing censuses with agriculture censuses" (FAO & UNFPA, 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 with some changes. In the light of lack of implementation, the theme on "Intrahousehold distribution of managerial decisions and ownership on the holding" (Theme 10 in WCA 2020) disappears as a theme and the information is collected in other themes accordingly.

1.29 The WCA 2030 is complemented by the census "Operational Guidelines" that was published under the WCA 2020 as Volume 2 (FAO, 2018a). Since the focus of the WCA 2030 is on concepts, definitions, and methodology, when operational aspects such as planning, implementation, use of resources and quality assurance are mentioned, the reader will be referred to the "Operational guidelines" for further information.

1.30 WCA 2030 has been developed after a review of country experiences with the 2020 programme and an assessment of changing data needs in light of developments in agricultural practices and through extensive consultations with countries as well as global and regional experts. As in the past, it is expected that countries will adapt the guidelines given in this publication to meet national needs.

Statistical unit, concepts, content, and classifications in WCA 2030

1.31 The main methodological differences between the 2020 and 2030 programmes are highlighted in the previous section (see paragraphs 1.22-1.28). Specific changes to statistical units, concepts and definitions, data content and classifications are summarized below:

1.32 ***Statistical unit***

- The statistical unit for the agricultural census, the agricultural holding, remains the same as used in previous programmes (see paragraph 4.2).
- The concept of an aquacultural holding remains the same as used in the previous programme (see paragraph 3.33).

1.33 ***Concepts and definitions***

- The definition of an agricultural holder remains the same as in the previous programmes (see paragraphs 4.19-4.22).
- Forest and other wooded land remain into line with the System of Environmental-Economic Accounting (SEEA) Central Framework adopted by the United Nations Statistical Commission (UNSC) in 2012 (UN et al., 2014) (see Chapter 7, Theme 2 Land).

- Work concepts have been updated to be consistent with the resolution adopted by the International Labour Organization (ILO) in 2023 (ILO, 2023a) (see Chapter 7, Theme 9 Work on the holding).

- An agriculture structure survey (deemed as sample-based census in previous programmes) is no longer considered as a "census". A census is a complete enumeration operation.

1.34 ***Data content***

- The present Programme maintains two categories of census items introduced in the WCA 2020: essential and additional (see paragraph 1.24 above) Following an assessment of country practices during the 2020 census round, the present Programme incorporates several changes in the list of census items. Some of the items are new, some are deleted, some are transferred to other themes, and others have changed their type (see Chapter 6 for more details):

  New items. Six items are introduced in the present round:

  - In Theme 2 (Land), Number of parcels (additional item 0202);
  - In Theme 4 (Crops), Area of temporary crops planted (essential item 0402);
  - In Theme 4 (Crops), Presence of hydroponics/vertical farming (additional item 0406).
  - In Theme 5 (Livestock), Number of animals per breed category (additional item 0505)
  - In Theme 6 (Agricultural practices), Use of technology on the holding (additional item 0613).
  - In Theme 7 (Services). Type of insurance coverage (additional item 0708)
  - In Theme 11 (Forestry), Whether forestry activities are practised (additional item 1104).

  Items changing of theme

The table below depicts the items that changed of theme.

Table 1.1 List of items that changed themes in WCA 2030

Theme in WCA 2020	Item number	Theme in WCA 2030	Item number	Description
Demographic and social characteristics	0801	Identification and general characteristics	0106*	Household size by sex and age groups*
	0806		0107*	Educational attainment of holder spouse and manager*
	0807		0108	Agricultural training/education of the holder
Intra-household distribution of managerial decisions and ownership on the holding	1002 1004	Land	0207	Sex of the household member managing the parcel
	1003	Livestock	0504	Number of animals by sex of the household member managing them
Environment/ GHG emissions	1501	Agricultural practices	0614	Type of animal grazing practices
	1502		0615	Manure application
	1503		0616	Manure management system

** Essential items.*

Themes and items omitted

- The theme “Intra-household distribution of managerial decisions and ownership on the holding”, which consisted of additional items to capture the role of gender in the holding’s decision-making process, was hardly covered by national censuses. For this reason, the theme was omitted from WCA 2030 and, instead, some items were moved to themes Land and Livestock to cover gender aspects (see Table 1.1). The role of gender is now captured in two rosters. In the first roster in theme Land, for each parcel, besides parcel area (item 0206) and tenure (item 0209), the sex of the household member managing the parcel (item 0207) could be asked. In the second roster in theme Livestock, for each livestock species, the number of animals by sex of the household member managing them (item 0504) could be requested.

- In case of Theme 11 (Household food security), one reason for omitting it from the Agriculture Census is that this theme is relevant to all households and not just households operating agricultural holdings. Another reason is that this theme is covered by household surveys to measure the SDG indicator 2.1.2 (see the 2030 Agenda and the Sustainable Development Goals, Chapter 2). Given this, this theme was omitted in the WCA 2030.

- The theme “Environment/GHG emissions” was covered less frequently by national censuses. Only items 1501-1503 were covered by a limited number of countries. This is due perhaps to the fact that the surveys are the main source to collect this type of data, mainly for relevant SDG indicators. Therefore, this theme was omitted in WCA 2030, and the three items 1501-1503 were moved to the theme “Agricultural practices” (see table 1.1). These three items continue to be relevant for the estimation of Greenhouse Gas Emissions (GHG). These items also contribute to the calculation of sustainability metrics such as Nitrogen Use Efficiency (NUE), a key component of SDG indicator 2.4.1.

- The additional item “Presence of soil degradation: type and degree” is omitted as it was hardly covered by national censuses.

- The additional items “Labour force status” and “Status in employment of main job” of the theme “Work on the holding” were omitted as they were deemed more relevant for the census of population and labour surveys. For the census of agriculture, items 0901 "Whether working on the holding is the main activity" and 0902 "Working time on the holding" are more relevant as they relate to agricultural activities. Table 1.2 depicts the omitted items and/or themes.

Table 1.2. List of themes and additional items omitted in WCA 2030

Theme in WCA 2020	Item number	Description
Land	0211	Presence of soil degradation: type and degree
Work on holding	0904	Labour force status
	0905	Status in employment of main job
Intra-household distribution of managerial decisions and ownership	1001	Sex of household members making managerial decisions
	1005	Number of livestock owned by sex of the owner
Household Food Security	1101 (a) to 1101 (h)	FIES
	1102	Effects of natural disasters
	1103	Extent of loss of agricultural output due to natural disasters
Environment/GHG emissions	1504	Final use of the treated manure
	1505	Length of the growing period of rice cultivation
	1506	Rice cultivation – irrigation and water regimes
	1507	Organic amendments to soils used for rice cultivation

	1508	Crop residues
	1509	Permanent crops – age of plantations

Items changing of category.

- In theme “Identification and general characteristics”, the item “Educational attainment of holder spouse and manager” (0107) changed category from additional to essential item. Likewise, in theme “Agriculture practices”, the item “Selected machinery and equipment used on the holding by source” (0604) changed category from additional to essential item.

Other changes

- The concept of “hired manager” in item 0114 “Presence of manager other than the holder” changes to “manager” to take into consideration the case when the manager is a non-paid family member or other.
- The item “educational attainment” for each member of the household in theme “Demographic and social characteristics” was divided in two items: “educational attainment of holder (including joint holders), spouse, and manager” (essential item 0107 in theme “Identification and general characteristics”), and “educational attainment for each household member excluding holder and spouse” (additional item 0805 in theme “Demographic and social characteristics”).
- Item 0413 “Use of each type of fertilizer” was relabelled as “Use of different types of fertilizing products” to encompass diverse types of plant nutrition inputs such as biostimulants.

1.35 ***Classifications***

- The WCA 2030 follows the internationally accepted FAO land use classification, which serves as the basis for the current land use classes of the SEEA Central Framework and the SEEA Agriculture Forestry and Fisheries (AFF) (see paragraphs 7.2.9 – 7.2.37). The land use class “Land under farm buildings and farmyards” includes now greenhouses and, therefore, land used for growing temporary or permanent crops under protective cover, which in WCA 2020 were under the classes “Land under temporary crops” and “Land under permanent crops”, respectively.
- The areas of economic activity have been updated to be consistent with the International Standard Industrial Classification of all Economic Activities (ISIC) Rev. 5 (UN, 2025a) (see paragraphs 7.1.25– 7.1.26).
- The Indicative Crop Classification and Classification of Livestock have been updated to be consistent with the Central Product Classification (CPC) Version 3.0 (UN, 2025b). (see Chapter 7, Themes 4 and 5).
- The classification of machinery and equipment has been updated based on the Harmonized Commodity Description and Coding System (HS) Edition 2022 (WCO, 2022, Chapter 7, Theme 6).

CHAPTER 2

IMPORTANCE OF THE CENSUS OF AGRICULTURE AND ITS INTERNATIONAL CONTEXT

This chapter discusses the importance of the census of agriculture for both stakeholders and data producers at national level. The chapter then puts the census of agriculture in the international context, acknowledging relevant development agenda (the 2030 Agenda, the Global Strategy to Improve Agricultural and Rural Statistics, and the 50x2030 initiative).

Introduction

2.1 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.

2.2 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. The importance of the census of agriculture in satisfying the needs of both stakeholders and data producers is discussed in the first part of the chapter.

2.3 WCA 2030 was developed at a crucial time for the international statistical agenda, in the midle of the 2030 Agenda for Sustainable Development. This highlighted new and emerging needs for statistics, including the interaction between agriculture and the environment, known as Green Growth, 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.

2.4 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” (Global Strategy, 2010) to provide a blueprint for a coordinated and long-term initiative to address the decline in national agricultural statistics systems and WCA 2030 has an important role in supporting such systems.

Stakeholders’ needs

Agricultural planning, policy-making and policy monitoring

2.5 The agricultural planning and policy-making process, and assessment and monitoring of results are evidence-based processes and heavily dependent on the statistical system. The agriculture census contributes to these processes in a number of key areas, including food supply and gender issues, statistical information on agriculture structure in small administrative units, the presence and extent of rare events, 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, access to insurance, 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, crop production-oriented, livestock production-oriented or mixed. The essential items recommended in WCA 2030 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. Monitoring the impacts of policies requires important amount of intertemporal information. Comparisons between censuses, across different areas of the same country, between countries in presence and in absence of the policies are of great value in assessing their impact.

Research, investment and business decisions

2.6 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.

2.7 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.

Food security

2.8 Assessing food security by means of the census of agriculture is challenging. As explained in paragraph 1.34, the theme "food security" was omitted in this programme because this theme is relevant to all households and not just households operating agricultural holdings and because it is covered by household surveys measuring the SDG indicator 2.1.2. 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, holding machinery and improved varieties of seed to help develop programmes for increasing food production.

2.9 The collection of community-level data (see Chapter 8) 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. Issues related to stability of food supplies, such as weather conditions and exposure to natural disasters, can also be studied through the community survey of the agricultural census.

2.10 The agricultural census also provides broad economic, social and environmental indicators to show the background against which the food economy operates. As discussed below, 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

2.11 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, poverty monitoring surveys and living condition 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.

2.12 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 and time worked, 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.

2.13 Census data on forms of payment of employment, 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.

2.14 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.

2.15 The concepts and definitions for work statistics applied in the WCA 2030 are in line with the Resolution concerning statistics of work, employment and labour underutilization (ILO, 2013) amended by the 21st International Conference of Labour Statisticians (ICLS) in 2023 (ILO, 2023a). See Chapter 7, Theme 9, paragraph 7.9.2.

Agriculture and the environment

2.16 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.

2.17 Environmental impacts due to 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 Annex 4, Theme 6 "Agricultural practices" items 0610 (Types of tillage practices), 0614 (Type of animal grazing practices), 0615 (Manure application), 0616 (Manure management system) and also see Theme 4, item 0413 (Use of different types of fertilizing products)).

2.18 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.

2.19 The Paris Climate Agreement (Paris, 2015) operationalized the objective of the United Framework Convention on Climate Change (UNFCCC, 2015) to stabilize greenhouse gas concentrations in the atmosphere "at a level that would prevent dangerous anthropogenic interference 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 farm production methods and land use, to estimate GHG emissions and monitor the achievement of their targets. Considering the need for significant increases in capacity development to improve the data collection and analysis related to climate change the WCA 2030 highlights the variables that can be collected to enhance UNFCCC reporting, while introducing 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.

2.20 Another important use of census information to measure environmental impact is with reference to land and water management. Agricultural land use and change, 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.

The role of gender in agriculture

2.21 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.

2.22 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.

2.23 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. WCA 2020 introduced a new theme (Theme 10 "Intrahousehold distribution of managerial decisions and ownership on the holding") intended to better reflect gender-based differences in decision-making and ownership of key agricultural assets, such as land and livestock. However, country practices showed that it was very difficult to obtain such information in the field. For that reason, in the present Programme, Theme 10 of WCA 2020 disappears and gender related data are moved to the themes Land and Livestock. As explained in Chapter 1 (paragraph 1.34), the role of gender could now be captured in a roster in theme Land, for each parcel, and in another roster in theme Livestock, for each livestock species. Overall, the gender related items include: sex of agricultural holder (item 0104), household size by sex and age groups (item 0106), sex of manager other than the holder (item 0115), sex of household member managing the parcel (item 0207), number of animals by sex of the household member managing them (item 0504), and working on holding for each household member of working age (which included data on sex of the household member) (items 0901 through 0903). Such understanding should lead to better-targeted policies and programmes.

2.24 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

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

2.26 Agricultural census data can be tabulated for any defined administrative or geographic area or for any particular type of holdings, which means that data can be provided for specific target groups required by a particular project. For example, if a project is designed to improve coffee-growing in a particular area, census tables can be prepared showing data for coffee growers in that specific area.

Statistical needs

Source of structural data including data for Economic Agricultural Accounts and National Accounts

2.27 The census of agriculture has an important role in compiling national accounts, together with other current economic data. 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 System of Environmental Economic Accounting 2012-Central Framework (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.

Holding-level data

2.28 The census of agriculture involves the collection of data at the individual holding level. It provides fundamental data on the organizational structure of agricultural holdings, such as number of farms and 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 species. Structural information provided by the census has a wide range of uses, which are examined in this chapter.

2.29 Holding-level census data collected for every holding in the target population allow statistics at the smallest administrative level. Further to the total area of crops planted, an agricultural census would show, for example, the number of holdings with each crop or 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 holding-level data from the agricultural census.

Advantage over the reporting system

2.30 The census of agriculture has a key role in providing quality data for the statistical needs of the agricultural sector. In cases where countries do not regularly implement censuses of agriculture and a programme of agricultural surveys as part of a multiyear programme of statistical activities, some of them compile agricultural statistics based on reports from field officials (reporting system). This system 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 benchmark source of agricultural statistics and a sample frame for agricultural surveys.

2.31 Another limitation of a reporting system from field officials is that aggregated data are usually forwarded up through the various administrative levels and this means that the only data available, for example for crop area, would be province or district totals. This means that data from a reporting system is often not available at the desired administrative levels across the country. Holding-level data from the agricultural census facilitate proper planning and implementation of the sample surveys of agricultural holdings, overcoming the above limitations of the reporting system.

Benchmarking data for agriculture statistics

2.32 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.

2.33 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 compact plantations. Data on the number of productive and non-productive trees can be used to project future production trends.

2.34 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 from other sources on the population dynamics of livestock herds, such as take-off and reproductive rates, can provide a base for projecting livestock numbers in future years for use in estimating milk and meat production.

2.35 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 different, 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. If sampling is involved, the sample results are subject to sampling errors in addition to the non-sampling errors that are also present in a complete enumeration. Countries should seek to quantify these and any other statistical factors to explain the reasons for discrepancies in the data.

2.36 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. In such cases discrepancies should be resolved prioritizing census data.

Frames for agriculture statistics surveys

2.37 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 (MSF).

2.38 Most common sampling frames in agricultural surveys are constituted by lists of holdings (which can be household-based), which could be supplemented by lists of areas of land, such as the enumeration areas (EAs), and 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, and also auxiliary information at other level such as number of holdings or livestock in the enumeration area (say), in order to improve the sampling design. Auxiliary information is paramount for stratification and calibration at the estimation stage; 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 species.

2.39 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.

2.40 The Global Strategy to Improve Agricultural and Rural Statistics (Global Strategy, 2015a) advocates for the building of a 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.

2.41 An MSF is “a frame that enables selection of different samples (including from different sampling designs) for specific purposes: agricultural surveys, household surveys, and farm management surveys. The MSF’s distinguishing feature is that it enables samples to be drawn for several different surveys or different rounds of the same survey, which makes it possible to avoid building an ad hoc frame for each survey. In the context of the Global Strategy, MSF is a frame or a combination of frames that covers the population of interest in its entirety, and that enables the linkage of the farm [holding] as an economic unit to the household as a social unit, and both of these to the land as an environmental unit. MSFs are designed to enable the integration of agriculture into national statistical system by establishing a closer link between results from different statistical processes and units” (Global Strategy, 2015a).

The statistical farm register

2.42 Another important aim of the agriculture census is being a first step for establishing a statistical farm register. A statistical farm register allows the dissemination of information on the basic structure of agricultural holdings, the selection of stratified or simple samples of agricultural holdings to be included in

structural or sectorial surveys. When updated regularly, it enables the analysis of historical trends on the agricultural farms structure. It could also constitute the basis for agricultural censuses if the censuses are based on registers in the future.

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

2.44 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).

2.45 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.).

Data on agriculture structure in the small administrative units

2.46 The complete enumeration provided by the census allows to collect structural information for small administrative units like districts, municipalities, villages, etc. The census is usually the unique opportunity to reach such a small level of disaggregation of structural data. Such data cannot be provided from sample surveys because of high sampling errors or because no sample is selected in this small administrative units. Furthermore, data from the census of agriculture can be used to apply small area estimation techniques to agricultural sample surveys to obtain better estimates at subnational levels (see paragraph 2.54).

2.47 On the other hand, special care must be taken to avoid disclosure of personal information in such units. For example, a large farm or a holding raising a special species of animal or a specific crop could be easily identified in a small administrative unit. Each country must put special care in the selection of items to be presented at this level of disaggregation. In Chapter 10 a section is incorporated about data confidentiality and data disclosure control.

2.48 The borders of each small administrative unit must be clearly identified and compatible with administrative subdivisions from other sources. All land in each small administrative unit needs to be unambiguously geo-referenced.

Data on rare events

2.49 An important strength of census of agriculture with a full coverage is that allows detailed tabulations in line with high user requirements, including data for small administrative units and information on rare events, such as emerging crops, rare crops and species of livestock, which may be of significant or increasing economic importance, especially for some regions or subpopulations of agricultural holdings. Rare events are events that are so rare that reliable data on them cannot be obtained by sample surveys.

2.50 In the present Programme, in Chapter 1, the provision of data on rare events is incorporated as a basic census objective. Rare events, as defined, are increasingly gaining economic and research importance thanks to new technologies and globalization that increase the cultivation of new varieties and

the breeding of non-traditional animals in the country.

2.51 Rare events should not be confused with non-significant items, which are also rare, but are of no significance and are not to be collected either by sample surveys or by the censuses.

Integrating census data with geospatial data

2.52 When holdings are georeferenced, census data can be linked to geospatial data and available GIS databases, which is extremely useful for and often in high demand by policy makers and other users. The linkage provides the opportunity to examine spatial patterns of the results of the implementation of policies, and to identify areas for government to further plan interventions and agribusiness opportunities for the private sector. The linkage makes also possible innovative analysis. If census data is linked to a water resources database, for example, users could analyse environment implications of farmers' use of irrigation and fertilizers. Granular census data make cross-comparisons possible for the lowest geographical level (see paragraph 5.50-5.55). The linkage makes possible mapping the distribution of holding types and other holding characteristics across agroecological regions.

2.53 Another use of the integration of census and spatial data is that it allows to set up a system to produce national wall-to-wall crop type maps. Timely, accurate and granular crop type maps allow a series of applications which increase the usefulness of the census and enhance its impact on the overall quality of the national agricultural statistics. Using the census data as the baseline, crop type maps have some applications in successive years during the inter-censal period, such as crop area indicators (see paragraph 5.62).

Using census data for Small Area Estimation

2.54 Often, information collected from national agricultural surveys allows estimation only for larger regions while direct estimates of agricultural statistics cannot be produced with an adequate level of precision at the sub-national local level. When estimates for local areas are required by policy makers, small area estimation (SAE) techniques could be implemented to obtain more precise estimators. It involves identifying "common variables" associated with a target indicator (e.g. crop areas) that are contained in both survey and census data and running a probabilistic model using the common variables as predictors. SAE addresses the shortcomings of sample surveys by 'borrowing strength' from census data to increase the precision of estimators for small areas.

2.55 FAO (2022a) illustrates the use of SAE to produce disaggregated estimates of SDG Indicator 5.a.1 by sex and at granular sub-national level, using a model-based technique to integrate a household or agricultural survey measuring the indicator with census microdata to generate estimates of higher quality.

Relevant international initiatives

Global Strategy to Improve Agricultural and Rural Statistics

2.56 The WCA 2020 informed that the "Global Strategy to Improve Agricultural and Rural Statistics" begun implementation in 2012 to help countries to adequately include agricultural statistics in the National Strategies for the Development of Statistics (NSDS). The Global Strategy was endorsed by the UNSC in 2010 for worldwide implementation and was designed as a 15-year, multi-phase process to provide a "framework for national and international statistical systems enabling developing countries to produce, and to apply, the basic data and information needed in the 21st Century".

2.57 During the first phase of its implementation (2012–2018), the Global Strategy was based on three pillars outputs produced through three technical components: Methodological Research, Technical Assistance and Training. The guidelines, handbooks and training materials developed during this phase are available at Global Strategy (2025). The census of agriculture contributes to the three pillars as follows:

- A minimum set of core data: the agricultural census contributes to many of the minimum set of core data, and it is specifically important for countries without an established and well-functioning annual survey programme. In the absence of an annual survey programme, the census can

provide about a third of the 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.

- A master sample frame: the census of agriculture is one of the main data sources for building the master sample frame. This master frame facilitates the integration of the census with the annual agricultural and rural survey programme. This pillar encouraged the design of a Strategic Plan for the Development of Agricultural and Rural Statistics (SPARS) mainstreamed into the National Strategy for the Development of Statistics (NSDS) for the integration of the agricultural census and surveys in the agricultural statistical system, with the census at the core.

- Capacity building: the planning and implementation of the census involves comprehensive capacity building activities, which can significantly contribute to the overall goal of strengthening capacity in the domain of agricultural statistics.

2.58 The second phase of the Global Strategy (2020–2025), starting in 2021, focus on the applying methodologies and approaches developed in the framework of the first phase and strengthening the statistical capacities of countries through the provision of training and technical assistance at national, regional and global level. The work of the Global Strategy is interlinked with the activities of the "50x2030 Initiative to close the agricultural data gap" (see below), aimed at collecting data in 50 low income and lower middle-income countries by 2030.

2.59 An important methodological development under pillar 2 was the elaboration of an Agriculture Integrated Survey (AGRISurvey) methodology for collection of relevant agricultural and rural data on a regular basis. AGRISurvey is a modular survey programme conducted on an annual basis during the intercensal period. It consists of one core module and three rotating modules: Farm income, labour and productivity", "Production methods and environment", and "Machinery, equipment and assets". More information about AGRISurvey is available at FAO (2025a).

The 50x2030 initiative to close the agricultural data gap

2.60 The 50x2030 initiative is a multi-partner program launched in 2018 that seeks to bridge the global agricultural data gap by transforming country data systems in 50 low and lower middle-income countries mainly in Africa by 2030. This initiative focuses on improving country-level rural and agricultural data by implementing an improved AGRISurvey methodology (see above), using the census of agriculture as the frame.

2.61 The initiative also supports the countries' production of four priority indicators, three from SDG 2, namely 2.3.1 (labour productivity), 2.3.2 (small holder income), 2.4.1 (land under sustainable production), and one from SDG 5, 5.a.1 (Women's ownership of agricultural land); and three additional SDG indicators: 1.4.2 (land tenure rights), 12.3.1 (food loss index) and 1.5.2 (economic loss attributed to disasters).

2.62 Low and lower middle-income countries benefiting from the initiative are those expressing demand and showing leadership. Partner countries are required to contribute resources to their chosen survey programmes, with the view of assuming financial and technical responsibility for the survey programmes in five to eight years. More information about the initiative is available here: https://www.50x2030.org/.

The Cape Town Global Action Plan for Sustainable Development Data

2.63 The Cape Town Global Action Plan for Sustainable Development Data (CTGAP) launched in 2017 provides a framework for planning and implementing the statistical capacity building activities needed to achieve the scope and intent of the 2030 Agenda (UNSC, 2017). The global action plan underpins the importance of reliable agricultural statistics for the assessment and monitoring of progress towards the 2030 SDGs.

2.64 The CTGAP proposes six strategic areas, each associated with several objectives and related implementation actions:

- Strategic area 1: Coordination and strategic leadership on data for sustainable development.
- Strategic area 2: Innovation and modernization of national statistical systems.
- Strategic area 3: Strengthening of basic statistical activities and programmes, with particular focus on addressing the monitoring needs of the 2030 Agenda.
- Strategic area 4: Dissemination and use of sustainable development data.
- Strategic area 5: Multi-stakeholder partnerships for sustainable development data.
- Strategic area 6: Mobilize resources and coordinate efforts for statistical capacity building.

As an integral part of the national statistical system, the census of agriculture mainly contributes to strategic areas 2 and 3:

- Under strategic area 2, the census of agriculture promotes the use of new and emerging technologies in data collection, data processing, dissemination, and analysis and the use of data from other sources (e.g. administrative registers and geospatial data).
- Under strategic area 3, the regular implementation of census of agriculture supports the monitoring needs of the 2030 Agenda (see next section) and provides the sampling frame for relevant agricultural surveys as an integral part of integrated census and survey systems.

The 2030 Agenda and the Sustainable Development Goals

2.65 The 2030 Agenda for Sustainable Development, adopted in 2015, proposed 17 Sustainable Development Goals (SDGs), each with its own set of targets and indicators. The work of FAO supports many of the goals, in particular SDG 2 – "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture". The indicators used to assess progress toward achieving various SDGs are derived mainly from surveys. While the census of agriculture is not considered a primary data source for tracking SDGs, it can play a supportive role in the development of indicators for SDG 2 and SDG 5 ("Achieve gender equality and empower all women and girls") in the absence of relevant household surveys and administrative sources.

2.66 While the SDG indicators are only valid until 2030, it is important for the reader to recognize that the contribution of the census of agriculture may remain relevant beyond the 2030 Agenda, when a new sustainable development plan should be agreed with possibly a similar set of indicators. Specifically, the census can provide partial data to monitor SDG Target 5.a addressing ownership or secure rights over agricultural land (FAO, 2017a). and SDG target 2.3 relating to the productivity and income of small holders[1]. More specifically, the census of agriculture can provide some data for several SDG indicators:

- 2.3.1: Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size;
- 2.3.2: Average income of small-scale food producers, by sex and indigenous status;
- 5.a.1.a: Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex;
- 5.a.1.b: Share of women among owners or rights-bearers of agricultural land, by type of tenure.

2.67 Furthermore, the census of agriculture supports the statistical system that monitors the SDGs and provides the sampling frame for the agricultural survey programme and a benchmark for the national agricultural statistics system. Also, as mentioned in paragraphs 2.54 and 2.55, agricultural censuses can provide data to improve estimates in small areas through models adjusted using SAE techniques.

2.68 Surveys and administrative sources are the preferred source of data to regularly monitor the progress in achieving the various SDG indicators. In contrast, censuses of agriculture are not considered a primary source due to several reasons. Censuses are conducted usually once every ten years, which limits their ability to closely track progress on the indicators. Secondly, the census coverage is restricted to structural elements of agriculture, which makes it inappropriate for estimating all needed indicators.

2.69 However, in the absence of regular household surveys and administrative sources, some countries have turned to the census of agriculture to include sample modules to collect some data to

[1] Agricultural censuses do not collect information on agricultural production, income, and detailed labour use required for SDGs 2.3.1 and 2.3.2 (see Annex 11).

estimate SDG indicators, such as SDG 2.3.1, 2.3.2, and 5.a.1. Annex 11 discusses how the agricultural census could provide partial data for these indicators. Therefore, the use of additional sources of data, such as household surveys and agricultural surveys, is strongly recommended.

CHAPTER 3

RELATIONSHIP TO OTHER CENSUSES

This chapter highlights relationships between the agriculture census and other data collections operations 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, economic census, and forestry and fisheries modules.

Introduction

3.1 In the WCA 2030, as in previous programmes, 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, extent of the overlap between the two operations, 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. Relationship with the population and housing census

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

3.3 The WCA 2030 continues the trajectory initiated by the WCA 2010, promoting a more robust linkage between population and housing censuses and agriculture censuses. Several countries embraced this approach during the WCA 2020. This stems from the recognition of the pivotal role played by a coordinated and integrated statistical system, where these two significant statistical activities serve as the main pillars of the entire system. Additional guidance on the relationship between these two censuses is available in publications such as the Guidelines for Linking Population and Housing Censuses with Agricultural Censuses (FAO and UNFPA, 2012), and Principles and Recommendations for Population and Housing Censuses Revision 4 (UN, 2025d).

3.4 Linking population and housing census data with agricultural census data offers numerous advantages. This linkage has the potential to significantly enhance the analytical value of datasets from both censuses and result in cost savings for data collection efforts. Given that many demographic and activity status data items collected in the population and housing census overlap with those in the agricultural census, establishing a connection between the two would eliminate the need to duplicate data collection in the agricultural census. This approach enables the creation of comprehensive cross-tabulations without redundant data collection processes.

Agriculture in the household sector

3.5 Linking the agricultural census and the population and housing census is particularly relevant in 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. 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, linking 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

3.6 The statistical unit of the census of agriculture is the agricultural holding, which is defined as 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 (see paragraphs 4.1- 4.2). By comparison, the primary statistical unit for a population census is the household. 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 linking the two censuses.

3.7 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 (see next paragraph). 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 4.4 to 4.16.

3.8 The need of linking the statistical units in both censuses cannot be over emphasized. The most direct way is by assigning the same identifier to each household in both censuses. This is possible when the agricultural census is based on a list frame provided by the population and housing census. When there is a one-to-one correspondence between the household and the holding, the matching is straightforward. However, when a holding is managed by various households or when one household manages several holdings, the linking of units can be complicated mainly if there is a time gap between the two censuses. In such cases, efforts should be made in determining the identifiers needed for matching the data. Sometimes a unique identifier based on a code that combines variables such as geographical coordinates, IDs, names, date of birth, gender, etc. may be very useful to match the units. Statistical methods of record linkage can help to finalize the matching.

Options for coordinating the agriculture and the population and housing censuses

3.9 The coordination between the two censuses can take several forms, ranging from coordinating operational aspects of the two censuses (e.g., cartography, enumeration areas) to the inclusion of 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 using data collected for each household member on main activity, type of industry and employment status. However, there are limitations to this approach; it may not cover all persons working in agriculture because of the seasonality of many agricultural activities through the year and because agriculture may not be a person's main activity. The FAO and United Nations Population Fund Guidelines (FAO and UNFPA, 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 not encouraged and generally feasible only for a few countries with extensive experience of merging censuses.

3.10 The coordination between the two censuses can cover:

- Coordinating aspects of the two censuses in terms of:
  - use of common concepts, definitions and classifications: using common statistical standards to ensure that data from the two sources are consistent and comparable, making it easier to analyse and interpret agricultural census data in relation to population census data;
  - sharing field materials: using the same EA boundaries, maps, and other field material such a data collection devices;
- Using existing topics from the population census as a starting point for the frame for the household sector of the agricultural census (see paragraphs 3.12 and 3.14);
- Adding screening items in the population and housing census for collecting agricultural data (see paragraphs 3.15 to 3.20);
- An agriculture module in the population and housing census (see paragraphs 3.21 to 3.25)

- The core module of the agricultural census in the population and housing census (see paragraphs 3.26 and 3.27.
- The two censuses as a joint operation in specific circumstances only (see paragraphs 3.28 and 3.29).

3.11 The following table summarizes the main ways of coordinating the agriculture and the population and housing censuses.

Table 3.1. Possible relationships between the Population and Housing Census (PHC) and Agricultural Census (AC)

Population and Housing Census (PHC)	Using only the usual PHC topics a) economic activity status, b) main occupation, c) industry of main occupation	With two optional screening topics, as recommended in P&R for PHC Rev. 4 (UN, 2025d): a) Whether the household is engaged in own-account agriculture production, b) Measure of farm size (land area and number of livestock)	With an agricultural module	With the core module of the AC
Agricultural Census (AC)	A starting point to build a household census frame. It should be followed by a listing operation before the AC	Build an accurate census frame and establishment of thresholds.	Build a census frame, establishment of thresholds, and easing the agriculture census questionnaire burden.	Build a census frame for the supplementary modules (SMs) in the modular approach and establishment of thresholds. The auxiliary information is used to improve sampling design and expansion factors for the SMs

Using existing topics from the population census

3.12 Some countries use some topics of the economic characteristics of the population and housing census to identify persons involved in own-account agriculture. The population census contains three "core topics" collected directly that are relevant for the census of agriculture:

(i) Occupation: helps to identify persons working in an agricultural occupation.
(ii) Status in employment: helps to identify persons who are employers or own-account workers.
(iii) Industry: helps to identify persons involved in activities such as growing of crops and animal production, according to the most recent revision of the International Standard Industrial Classification of All Economic Activities (ISIC).

3.13 There are severe limitations upon the use of such narrow topics for building the household frame for the census of agriculture (FAO and UNFPA, 2012; UN, 2025d). First, the population census normally collects information about a person's main job or work activity during a short reference period (usually one week prior to the census), which may not cover all persons working in agriculture because of the seasonality of many agricultural activities. Second, agriculture may not be the main activity of the person, but a secondary activity. Third, the population census provides data on all persons working in agriculture, including paid employees. The latter information (paid employees) is outside the scope of the agricultural census as its focus is on households with own-account agricultural production.

3.14 Therefore, the combination of these three core topics does not produce an accurate or complete list of farm households. However, they may still be useful as a starting point for the listing exercise of the agriculture census. This initial household list is only useful if the agricultural census is carried out soon after the population census; otherwise, the list of households quickly becomes out-of-date and the list needs to be updated.

Adding screening items in the population and housing census for collecting agricultural data

3.15 As indicated in Principles and Recommendations for Population and Housing Censuses, Revision 4 (UN, 2025d[2]), countries wishing to build a reliable frame of households involved in own-account agriculture may consider including additional agriculture-related items in its population census to address the limitations mentioned above. Two topics are recommended. The first 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 during the year preceding the population census day. If that is the case, the second topic requests key data on farm size – such as the land area used for agricultural production and the number of livestock (for the main livestock species) – on the census reference day.

3.16 The first topic is especially useful for establishing a frame for a subsequent agricultural census and surveys and for this reason is recommended and discussed below. Therefore, the basic screening items recommended for including in the population and housing census are as follows:

Screening items

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

Reference period: a year before the population census reference day

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

Reference period: population census reference day

3.17 Screening 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 during the year preceding the census, either at their usual residence or elsewhere. This refers to households using land (wholly or partly) for agricultural purposes or raising livestock. As noted at paragraph 3.13, a year-long reference period is necessary to capture seasonal variations, which would not be possible with the shorter reference period used in other population census topics pertaining to economic characteristics. Households with members engaged in agricultural activities only as paid employees would not qualify. **Item 2** collects information at the household level on the size of the farm (land area or number of plots) used for agriculture and the number of livestock reared (for the main livestock species) on the population census day. This helps assess the extent of a household's agricultural activities and establish a suitable threshold for the census of agriculture (e.g. a minimum size limit for inclusion).

3.18 By including these two screening items or questions, the following key uses for data collected from the population and housing census are possible:

- serving as a frame for the household sector of the agricultural census;
- improving sample design for surveys; 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.

3.19 Alternatively, the two screening items can be collected in the pre-census listing phase of the population census so as not to overburden the questionnaire. This later approach has the added advantage in that the frame for the census of agriculture can be compiled directly from the listing exercise without having to wait for the population census questionnaire to be processed.

3.20 Information on forestry, fishery and aquaculture activities may also be collected through the population and housing census in cases when these activities are also important at the household level 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 5).

[2] These agriculture topics are presented in Part 5, Chapter II, Table 5.1, section J; and discussed in Part 5, Chapter IV, section J of UN (2025d).

An agriculture module in the population and housing census ahead of an agricultural census

3.21 Countries wishing to collect more extensive data on agriculture may include an agriculture module in the population and housing census ahead of a census of agriculture. The additional data is usually used for a more precise characterization of the frame of households with agricultural activity and the definition of a threshold for the forthcoming census of agriculture and eases the burden on the agriculture census questionnaire. Moreover, the additional data, such as area of holding, number of livestock, type of land tenure, etc., are auxiliary information that can be used to improve the sampling design and stratification of agricultural surveys.

3.22 The list of suggested items to include in an agriculture module into the population census are:

Suggested items for an agriculture module

Item 0101: *Identification and location of agricultural holding*
Item 0103: Legal status of agricultural holder (type of holder)
Item 0201: Total area of holding
Item 0203: Area of holding according to land use types
Item 0204: Area of holding according to land tenure types
Item 0302: Area of land actually irrigated: fully controlled and partially controlled irrigation
Item 0401: Types of temporary crops on the holding
Item 0407: Types of permanent crops on the holding and whether in compact plantations
Item 0415: Presence of nurseries
Item 0417: Presence of cropped land under protective cover
Item 0502: Number of animals
Item 1001: Presence of aquaculture on the holding (if relevant in the country)
Item 1101: Presence of woodland on the holding
Item 1201: Engagement of household members in fishing activities (if relevant in the country)

3.23 The suggested items listed above are primarily relevant at the household level. The required household-level information can be collected as part of the main enumeration. As mentioned above, the screening items can alternatively be included in the pre-census listing phase of the population census so as not to overburden the questionnaire. In this manner, the frame for the census of agriculture can be compiled directly from the listing exercise without having to wait for the actual population census.

3.24 The suggested items mentioned above for the agriculture module in the population and housing census are a subset of essential WCA 2030 items (see chapter 6). The suggested items go beyond the screening items to cover a wider range of data on agriculture in the household sector, which could be used to provide auxiliary information for the census of agriculture.

3.25 If including all the suggested items in the agriculture module is difficult and the country considers that it could jeopardize the quality of the population and housing census, items could be selected to fit national needs. Approaches for selecting items are further detailed in Guidelines for Linking Population and Housing Censuses with Agricultural Censuses (FAO and UNFPA, 2012).

The core module of the agricultural census in the population and housing census

3.26 Some countries, mainly in Africa, that favoured the modular approach, piggyback the core module of the agricultural census onto the population and housing census and implement the supplementary modules later, using the core module as the frame for the household sector. The main reason for using this approach is to cope with limited resources available for the census of agriculture. As stated above (paragraph 3.9), conducting the two censuses as a joint field operation is not encouraged and feasible only in a few countries with extensive methodological and field experience.

3.27 As explained in chapter 5, the core module should include items needed to build the frame for the subsequent sample-based supplementary modules and any essential items needed at the lowest administrative level, to capture data on rare events and to establish a threshold, if any, for the supplementary modules. The core module in the population census should provide the auxiliary

information needed to adequately prepare the sampling design and stratification of the subsequent sample-based supplementary modules. The core module should not repeat items already covered in the population census questionnaire, such as demographic and economic activity status data like household size, age, sex, occupation, etc.

The two censuses as a joint operation

3.28 A few countries conduct the population and housing census and the agricultural census as a joint field operation. This could be in the form of an agriculture module inserted in the population census questionnaire (e.g. in some Pacific Island countries) or in the form of two separate questionnaires (e.g. in Canada and Georgia) to retain separate identities. In both cases, field operations are synchronized so that the two data collections can be done at the same time by the same enumerators. The inclusion of an agriculture module in the population census questionnaire is favoured in some Pacific Island countries because these countries are composed of scattered atolls, fieldwork costs are high, and logistical challenges make costly conducting the two censuses separately. Conducting the two censuses as a joint field operation is usually not recommended, but this was seen as a feasible solution in these countries.

3.29 Although the approach reduces the cost of data collection and provides an immediate link between population and agricultural census household-level data, there may also be some problems in taking this approach. Countries usually face administrative problems in synchronizing the two census field operations, and special coordination arrangements need to be put in place to successfully carry out the joint operation. Furthermore, training adequately field staff on all population and agricultural census items is challenging. This is especially so if different government agencies are responsible for the two censuses (e.g. the NSO and the Ministry of Agriculture). Furthermore, several essential items recommended by the WCA are excluded from the questionnaire to keep the number of questions in check. Another problem is that agricultural holdings in the non-household sector are not covered in the population census and need to be enumerated separately, sometimes with a different reference period. Another setback is that it increases the burden on enumerators and respondents, which may be detrimental to the quality of the data.

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

3.30 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 7, theme 10 and Annex 4, theme 10). The WCA 2010 introduced this idea that continues in the present programme. 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, 1997) and Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework (Global Strategy, 2015b).

Scope of the aquacultural census

3.31 According to ISIC (Rev. 5), 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, 2025a). Statistically, the two censuses are separate, but operationally, they can often be combined into a single field enumeration system, particularly in the case of freshwater, inland aquaculture or in the case of integrated aquaculture. Such a joint census is referred to as a “census of agriculture and aquaculture”.

3.32 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 7, Theme 10 “Aquaculture”, paragraphs 7.10.3 –7.10.6 that also include a clear distinction between aquaculture and capture fisheries.

Statistical unit for the aquacultural census

3.33 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.

3.34 Aquaculture facilities comprise ponds, tanks, raceway, pens, cages, hapas, lines and stakes and the area of water body they occupied for aquaculture production; the rice-cum-fish culture area and related facilities should be considered part of aquaculture facilities.

3.35 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

3.36 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 9.

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

- 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 or statistical registers. This usually may be applicable for the non-household sector.

3.38 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 and/or aquacultural production activities. Use this information to identify all agricultural holdings and all aquacultural holdings.
- Add the holdings in the non-household sector (e.g. enterprises) and enumerate all agricultural holdings and aquacultural holdings (i.e. from both household and non-household sectors) to collect data for the census of agriculture and aquaculture.

3.39 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 to "Sex of holder" and "Age of holder", to describe the age or sex of the decision-maker for either an agricultural holding or an aquacultural holding. Also, Item 0110 "Main purpose of production of the holding" would need to be amended for the aquacultural census to cover income from aquacultural production.

3.40 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 0205 (location) where a parcel is not located in an administrative division, but in the sea. Item 0211 (use of shifting cultivation) and item 0212 (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: Services for agriculture. These items should also cover services for aquaculture. Items 0701, 0702, 0703, and 0704, relating to the use of credit facilities, should include credit for aquacultural purposes. Item 0708 should include insurance for aquaculture activities. Items 0705 and 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 0905, relating to contract work on the holding, should also include work for aquacultural production.

3.41 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 must be carefully designed to ensure that those needs can be met.

3.42 An efficient way of carrying out the agricultural and aquacultural censuses together is through the modular approach. If a country decides to implement the joint census using the modular approach, the core module provides a limited set of key data on the structure of agricultural and aquacultural holdings and a sample-based supplementary aquaculture module provides more detailed data. The items related to basic structural data, such as household size and land use, should be included in the core module.

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

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

C. Relationship with economic census

3.45 The agricultural census is a component of the overall economic statistics system based on the System of national Accounts (SNA) and International Standard Industrial Classification of all Economic Activities (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.

3.46 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, provided that small and medium-sized holdings from the household sector are not excluded. This opens up the possibility of integrating the agricultural census into the economic census programme. This can take several forms:

- 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.

- 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 (e.g., corporations, cooperatives, and establishments with payroll) 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.

- 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 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.

- 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. Forestry module

3.47 The scope of an agricultural census is defined under ISIC (Rev.5) and falls under groups 011 to 015 (UN, 2025a) (see paragraph 4.24). Forestry is an economic activity under the ISIC division 02 and, therefore, it is not covered by the census of agriculture unless the holding also has some crop or livestock production activities. Forestry encompasses activities under ISIC group 021 (silviculture and other forestry activities), group 022 (logging activities), group 023 (gathering of non-wood forest products) and group 024 (support services to forestry, including carrying out part of the forestry operation on a fee or contract basis).

3.48 As in previous programmes, the WCA 2030 offers a forestry theme of five additional items (see Theme 11 in Annex 4) for countries wishing to include a module to collect some forestry data, preferably on a sample basis, from agricultural holdings.

3.49 In a few countries, there is a demand for data from households with woodland potentially usable for forestry production, resource protection, improving agricultural production, social and cultural values, recreation, ecotourism or other purposes. Countries wishing to collect data for small-scale forestry and other activities at household level would need to widen the agricultural census to collect limited additional forestry data on all households. This implies to expand the statistical unit of the census of agriculture to account for households (non-agricultural holdings) with woodland (without regard to title or legal form) and build a wider frame to cover all these units. The widened agricultural census is not intended to target forest estate and large-scale commercial forestry, which use separate frames, different units of enumeration, and combined measurement methods, including satellite imagery. Data on these units are usually covered

by other collection systems. Table 3.2 describes a forestry module in the modular approach, both in the case of a typical census of agriculture and in the case of a widened census. It should be noted that the latter case is complex to implement and not very cost effective. Thus, case A in table 3.2 is preferable.

Table 3.2 A forestry module in the census of agriculture

	A. Typical census of agriculture	B. Widened census of agriculture
Scope	Agricultural holdings	• Same as case A, plus • Households (non-agricultural holdings) with woodland
Frame	The same as for the census of agriculture	• For agricultural holdings: same as case A • For households (non-agricultural holdings) with woodland: created during the listing phase or population census by asking Item 1101 to all households
Census methodology (modular approach)	• Core module: item 1101 • Supplementary forestry module (sample-based): items 1102 to 1105[1]	• For agricultural holdings: same as case A • For households (non-agricultural holdings) with woodland: module to a sample of units from the census frame

[1] Item 1101 corresponds to "Presence of woodland on the holding". For items 1101 to 1105 see Theme 11, Annex 4.

E. Fisheries module

3.50 As mentioned above, the scope of an agricultural census falls under ISIC groups 011 to 015 (UN, 2025a) (see paragraph 4.24). Therefore, capture fisheries activities, which fall under ISIC group 031, are separate economic activities and remain outside the scope of the agriculture census. Since the WCA 2020, the census programme offers a fisheries theme of seven additional items (see Theme 12 in Annex 4) for countries wishing to include a module to collect some fisheries data, preferably on a sample basis, from agricultural holdings.

3.51 Despite this, in some countries, there is still a demand for data on household subsistence fishing. Countries wishing to collect data for small-scale fishing activities at household level would need to widen the agricultural census to collect limited additional fisheries data on all households on a sample basis. This implies to expand the statistical unit of the census of agriculture to account for households (non-agricultural holdings) also involved only in own-account fishing activities and build a wider frame to cover all these units. The widened agricultural census is not intended to target large-scale commercial fishing, which uses separate frames and units, and methods of enumeration. Data on these units are usually covered by other collection systems. Table 3.3 describes a fisheries module in the modular approach, both in the case of a typical census of agriculture and in the case of a widened census. It should be noted that the latter case is complex to implement and not very cost effective. Thus, case A in table 3.3 is preferable.

Table 3.3 A fisheries module in the census of agriculture

	A. Typical census of agriculture	B. Widened census of agriculture
Scope	Agricultural holdings	• Same as case A, plus • Other households engaged only in own-account fishing activities
Frame	The same as for the census of agriculture	• For agricultural holdings: same as case A • For households engaged solely in own-account fishing: created during the listing phase or population census by asking Item 1201 to all households
Census methodology (modular approach)	• Core module: item 1201 • Supplementary fisheries module (sample-based): items 1202 to 1207[1]	• For agricultural holdings: same as case A • For households engaged solely in own-account fishing: module to a sample of units from the census frame

1 Item 1201 corresponds to "Engagement of household members in fishing activities". For items 1201 to 1207 see Theme 12, Annex 4.

PART TWO

The World Programme for the Census of Agriculture 2030

CHAPTER 4

CONCEPTS AND DEFINITIONS

This chapter presents the concepts and definitions that should 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. Other critical concepts such as the scope, coverage, threshold, census reference period, and timing of the census are discussed. The main steps involved in developing and undertaking an agricultural census are outlined.

Statistical units

4.1 The statistical unit for 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 2030.

The agricultural holding

4.2 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."

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

4.4 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, cooperatives, military, educational institutions, prisons, religious organizations, and government institutions. In most developing countries, the majority of agricultural production is in the household sector.

The household

4.5 ''The concept of "household" is based on the arrangements that a person or a group of persons make to provide themselves with food and other essentials for living. A household may be either: (a) a one-person household, where a person who makes provision for their own food and other essentials for living without combining with any other person to form a multi-person household; or (b) a multi-person household, which consists of a group of two or more persons living together who make joint provision for food and other essentials for living. Members of such a group may pool their resources, share a common budget, and may be related or unrelated to each other.'' (UN, 2025d, paragraph 2.41).

4.6 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 provisions 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.

4.7 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 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.

4.8 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, this 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 individual 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).

4.9 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. For those countries, there is little difference between an agricultural holding and a household with own-account agricultural production and 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.

4.10 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 4.2) and the coverage of the agriculture census (see paragraphs 4.27 - 4.30) should be clearly stated in the census dissemination products to help clarify interpretation of data.

4.11 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 account concept of establishment should be used (see Annex 1), whereby an establishment is an economic unit engaged in one main production activity, operating in a single location.

4.12 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.

4.13 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. However, farms using communal lands should be identified with the purpose of conducting analysis of their characteristics and impact on agriculture.

4.14 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.

4.15 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. Link to land registers can contribute to recomposing information before the change of holder.

4.16 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.

4.17 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

4.18 The agricultural holding is divided into parcels, such that a parcel is any piece of land of one land tenure type (see paragraphs 7.2.38 – 7.2.46) 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.

4.19 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

4.20 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 manager.

4.21 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, bears financial risk, and exercising management control over the agricultural holding operations, in conjunction with one or more other persons. If analysis of decision-making processes in the holding reveals that there are two quite distinct agricultural management units, the holding should be split into two agricultural holdings. In case of existence of joint holders in a holding, information on the identification of all joint holders, their age, sex, education attainment, agricultural/training, national/ethnic group, should be collected to enrich the holding identification and its general characteristics.

4.22 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 manager different from the holder. Usually, in the household sector the manager and the holder are the same person. In case they are not, the manager can be an employee of the holding (hired manager) who is paid in cash, kind or both, or he/she can be a non-paid person (a family member or another non-paid person). WCA 2030 distinguishes manager (item 0114) from the holder. This distinction is important to analyse different forms of holdings management. The 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.

4.23 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, if they are both different people; 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

4.24 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. Support activities to agriculture and post-harvest crop activities, such as agroprocessing, are out of the scope of the agricultural census (see 4.25). 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. For the 2030 round of agricultural censuses, that vision remains valid, and units engaged in forestry, fisheries, and aquaculture are not covered unless they also had some crop or livestock production activities.

4.25 International statistical standards for defining areas of economic activity have been established by ISIC (UN, 2025a). For more information on ISIC, see Annex 2 and Annex 3. The scope of an

agricultural census may be defined under ISIC (Rev.5) (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

4.26 Units merely producing agricultural services, such as agroprocessing and other post-harvest crop activities, fall under ISIC group 016 (see Annex 1) and are generally not included within the scope of the agricultural census. The scope should be clearly stated in the census dissemination products to help in the interpretation of data (see paragraph 4.9).

4.27 However, it is recognized that other activities outside the agricultural production industry, such as aquaculture (ISIC group 032) and forestry (ISIC groups 021-024), are becoming increasingly important in many parts of the world. Since WCA 2010, countries were given the option 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 2030. Further information on the aquaculture census is given in Chapter 3.

Coverage of the census of agriculture

4.28 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, areas with security problems or certain types of holdings (e.g., small subsistence holdings, see cut-off threshold below). In some countries, peri-urban agriculture plays an important role in metropolitan areas. 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, schools and/or religious organizations are also omitted, which results in incomplete coverage of the census.

4.29 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.

4.30 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 frame provided by 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.

4.31 It is very important that countries clearly specify the coverage in the presentation of agricultural census results. When certain geographic areas are excluded or certain holding types are omitted, this should be highlighted in the census dissemination products to help users interpret and analyse the results.

Cut-off threshold

4.32 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 family or kitchen garden (see more about land used for kitchen gardens in paragraph 7.2.29). The inclusion of small holdings is also important to reflect women's participation in agricultural work (see paragraphs 2.21-2.24).

4.33 Various criteria may be used to establish minimum size limits, such as area of holding,

agricultural area, 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 species of livestock. In any case, the threshold criteria should be clearly stated in the census report to help users interpret and analyse the results. However, complex thresholds should be avoided. The threshold criteria to define the target population should be simple and clearly stated, known both to census personnel, respondents and users, and specified in the census report to help the interpretation and analysis of census results. A simple threshold would be easily implemented in the CAPI app, used by enumerators, and understood by users.

4.34 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.

4.35 Because of the contribution of small-scale farming to home food security and total agriculture produce, it is important to have some estimate of its impact. The screening questions mentioned above can also be used to obtain a sampling frame of units below the threshold having some farm activity to allow conducting a sample survey on them. See Chapter 9 of the "Operational Guidelines" (FAO, 2018a) and Chapter 4 of the "Global review of agricultural census methodologies and results (2006–2015)" (FAO, 2021a) for more information about thresholds used by countries.

Reference period

4.36 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 periods for data collected for individual non-inventory 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 0509 to 0513) where a reference period of less than 12 months may be appropriate. In the case of item 0606 (Percentage of each major agricultural product sold), it is suggested to use any suitable reference period (e.g., the main harvest or the census reference year).

4.37 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

4.38 Timing of the agricultural census is of great importance. The WCA 2030 covers the ten-year period 2026–2035. Countries are recommended to carry out at least one agricultural census during this period. However, where rapid changes are occurring in their agricultural structure, countries may prefer to conduct two censuses at five-year intervals. If the census scope is limited, a five-year interval agricultural census is more feasible and can provide a fairly up-to date frame for intervening annual sample surveys. Countries are encouraged to undertake their agricultural census in 2030 or as close as possible to that year, 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.

4.39 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.

4.40 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.

4.41 Another issue related to timing is the potential overlap between the calendar for political elections and the implementation of the census. Census coordinators should consider the schedule of upcoming elections when planning for the census. It is advised to perform the census operation at a distance from any significant political election to prevent conflicts and minimize any misunderstandings that might harm the cooperation with respondents and the accuracy of the data.

4.42 The timing of the census of agriculture could be affected by unforeseen events, such as COVID 19 pandemic. Some countries fared better than others in overcoming the challenges posed by the pandemic, largely due to prior advancements in national statistical systems, the adoption of various ICT solutions, and the sourcing of census data from administrative registers. These measures enabled significant reduction in reliance on physical contact for key activities, including the final preparation of fieldwork, training, and data collection. Additionally, e-learning platforms and online courses played a crucial role in the training of trainers, supervisors, and enumerators during the pandemic as countries went into lockdown (see paragraph 5.47 and Castano, 2020).

4.43 Following a successful and satisfactory census, it is advised to conduct next ones at regular intervals unless there are compelling reasons to deviate. Consistent census dates improve data comparability, facilitate analysis and encourage administrative compliance by ensuring that everyone involved in the census completes all essential preparations on time.

4.44 An important issue faced in several censuses is related to the timing of the implementation of field operations. A specificity of the census of agriculture is that it is highly dependent on the agricultural and cropping calendar. The planning of the census field operations must take into account the agricultural seasons in the country (some countries may have more than one cropping season). In addition, field operations may be better carried out at certain periods of the year due to operational reasons (transportation, heavy rains, etc.) and recommended to be undertaken as close as possible to the reference period selected.

4.45 It is desirable to keep the enumeration period short. If possible, it should not extend beyond one month, in order to avoid mistakes on some items collected in the census caused by variability of some events such as employment in agriculture, movement of livestock, etc, which can occur in spite of a precise reference date and period.

Content of the agricultural census

4.46 The agriculture census continues to play a key role in the collection of structural statistics on the

agriculture sector as well as in providing the baseline and frame for agricultural surveys, including intermediate agriculture structure surveys, since the decennial census alone cannot capture the quick changes for some data (e.g., production, prices, farm labour data). It is important to remember that a census should be limited to the provision of data that neither a sample survey nor administrative systems can provide. The content of the census should be limited to the structural data and items needed for frames for agricultural surveys, rare events, data for small administrative units and benchmarking data.

4.47 Apart from the items to be included, detailed in Chapters 6 and 7, there are other important data that would be part of the census questionnaire. For example, identification keys are needed to integrate data from other sources and to perform record linkages. The georeferencing of holdings facilitates fieldwork, the presentation of results, and the linking of the agricultural census data to relevant GIS databases (see next section). The name of the respondent (item 0102) is an additional item needed for supervisory work in re-visits during or after the fieldwork or for checking census coverage through post-enumeration surveys. Broadly speaking, it is always important to keep in mind that the census is key in the integration of agriculture and rural statistics and the census should collect the items needed to adequately fulfil that role.

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

- The data needs of agricultural policymakers and planners. The agricultural census should be developed specifically to meet the needs of agricultural policymakers and planners. Data requirements will be different in each country, depending on the policy issues and priorities.

- The suitability of the census vehicle for the collection of the data required. An agricultural census is intended to collect structural data and the items included should focus primarily on those types of data. Items requiring in-depth questions, such as cost of production, are best collected in other agricultural surveys.

- The technical, operational and financial resources available to undertake the census. Conducting censuses is not only costly but also requires considerable human resources for the development, data collection and data processing. Countries need to balance the need for data against the resources available. The ability to produce timely data is an important issue.

- The willingness and ability of the public to supply the information required. Care is needed in the selection of items and the design of questionnaires to ensure that reliable data can be collected from respondents. Some items may be sensitive because of cultural or economic reasons - for example, respondents are sometimes reluctant to supply land data because they fear it may have taxation consequences. In these cases, communication and publicity explaining the protection of confidentiality of data, are crucial.

- The data collected in previous rounds of the agricultural census. Collecting the same data as in past censuses can be valuable in tracking changes in the structure of agriculture over time. However, this is valid only in the case of structural items. Non-structural items, in turn, should not be automatically carried over from one census to the next without reviewing their continuing relevance to current data needs and the suitability of the concepts and definitions used. Some countries tend to build up census questionnaires over previous ones and this practice usually leads to overloaded census questionnaires adding burden to respondents, unnecessary costs and jeopardizing the overall quality of census data.

- The need for data for international comparisons. The recommended items will provide the basis for FAO to make a global assessment of agricultural holdings. FAO recommends that all countries collect these items so that international comparisons can be made.

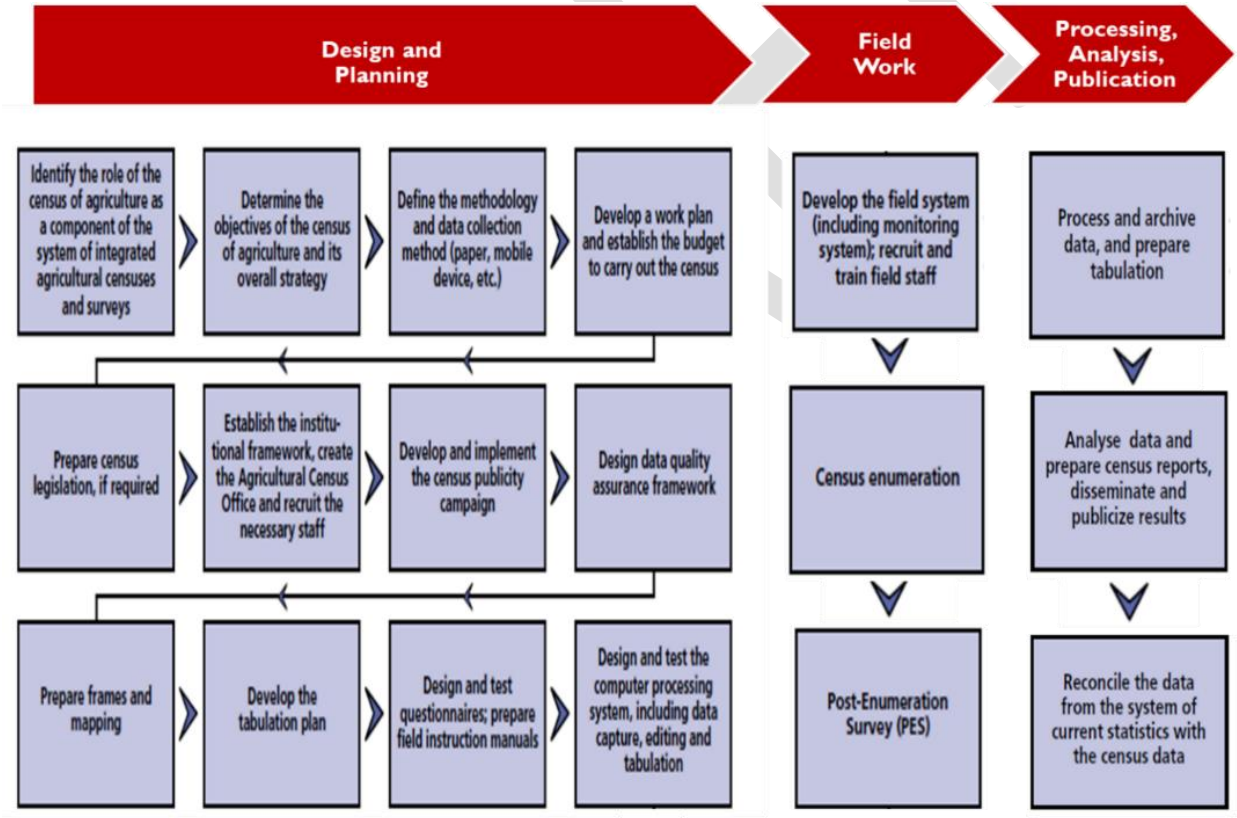
- Items available from administrative and other sources. Some census items could be entirely sourced from available good administrative or other (e.g. geospatial) data for all or a group of respondents. These items could be excluded from the census questionnaire, reducing response burden.

Steps in developing the census of agriculture

4.49 Information on how to develop and conduct an agricultural census is discussed in the Operational Guidelines of the World Programme for the Census of Agriculture 2020, Volume 2, Operational Guidelines (FAO, 2018a). Figure 4.1 shows the steps in a sequential order, although in practice most steps are implemented simultaneously (in parallel with others). The steps and associated activities are grouped in three phases:

- Phase 1 is the most time-consuming phase and often underestimated by countries in terms of both, duration and resources. It covers planning of the census, methodology, legal and institutional framework, work plan and budgeting, census frame, tabulation plan, and design and testing of questionnaires, enumeration manuals and data processing systems.
- Phase 2 relates to the preparation of census fieldwork, recruitment of field staff, training, implementation of data collection, and the Post-Enumeration Survey (PES).
- Phase 3 refers to the census data processing and archiving, data analysis, reporting and dissemination, and the reconciliation of discrepancies between current statistics and the new census results.

Figure 4.1 Phases and steps in developing and conducting the census of agriculture



CHAPTER 5

METHODOLOGICAL CONSIDERATIONS

This chapter discusses the key methodological issues to be considered in the 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. Regarding the approach to data collection, in some cases combining complete and sample enumeration provides a cost-effective solution, if a modular census is to be undertaken. The loss of detailed information at subnational levels, and particularly for the smallest administrative units, must be carefully considered when deciding on the sample design. 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 the Operational Guidelines (FAO, 2018a).

Introduction

5.1 Chapter 1 stressed that the census of agriculture should be conducted at least once every ten years by complete enumeration, focusing only on structural items, while the inter-censal programme of surveys should use the census frame to collect non-structural current data. It was noted that a "census" conducted on a sample basis was considered an agriculture structure survey (see paragraph 5.6). 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 in the WCA 2010. It was also recognized that many of the items in the sample-based supplementary modules could be considered "non-structural", in the sense of changing rapidly over time, and it could be argued that they were better suited to the statistical survey programme. The WCA 2020 emphasized this fact by referring to these non-structural items as additional items, which do not require estimates at the smallest administrative level and therefore could be collected on a sample basis.

5.2 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 recognize that fast-changing non-structural items are best collected through the survey programme. 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.

5.3 The WCA 2030 retains the idea that a wide range of items can be covered, while acknowledging that the census of agriculture can be conducted in many ways. However, the Programme continues to stress that the agricultural census should be restricted to structural items as much as possible. Important items to be covered by complete enumeration are essential items (see paragraph 1.24). The rest of items are classified as additional.

5.4 For the purposes of this publication, three 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 the three modalities and not in whether complete or sample enumeration is used. An overview of the three modalities for conducting the census is provided in the following sections.

5.5 The WCA 1960 introduced the possibility to use sampling methods in censuses of agriculture, especially for countries with underdeveloped agricultural statistical systems and lacking the needed resources to fund a complete enumeration operation. The WCA 2020 deemed them as “sampled-based censuses”. In the current program, these operations are now referred to as "agriculture structure surveys" rather than "censuses" due to several reasons. Firstly, the WCA defines a census of agriculture as a statistical operation aimed at collecting data on the structure of agriculture, enumerating either the entire country or a substantial portion of it. Secondly, a census by complete enumeration of the target population aligns with the objectives outlined in Chapter 1, which include providing comprehensive data on agricultural structure, even for small administrative units and rare events, offering benchmark data, and creating frames for agricultural sample surveys. In contrast, a sample-based census of agriculture falls short of providing information for each population unit, generate data for smaller administrative units and rare events, and establish adequate frames for agricultural sample surveys. Consequently, this programme will use the term “agriculture structure survey” to describe such endeavours.

5.6 An agriculture **structure survey** is a sample survey aimed to collect structural data on the entire country or for substantial regions of it. The purpose of the agriculture structure survey is to obtain data, at regular intervals, on the structure of agricultural holdings in a country to monitor trends and transitions in their structure since the last census. Usually, the survey questionnaire is like a census questionnaire because of the structural character of its items but it should not be confused with a census. In fact, in the present programme an agricultural census always implies complete enumeration of holdings in the target population.

The classical approach

5.7 The classical approach may be considered a census conducted as a single one-off operation in which all the essential items are recorded. 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 approach usually uses a single questionnaire which includes all “essential” items (see paragraph 6.8) and may include additional items (see paragraph 6.12) that the country requires to be collected at the same low geographical level to generate reliable statistics for small administrative units. However, the questionnaire does not need to be overburdened with an excessive number of additional items that may affect the overall quality of the census. The classical approach should be focused on collecting a coherent and manageable set of items. Chapter 10 of the Operational Guidelines (FAO, 2018a) provides practical details of this approach.

5.8 In a few instances, countries wishing to add items that are not usually covered in the census, resort to a combination of a short and a long questionnaire to reduce costs and burden on the respondents. In this case, the short questionnaire should contain all the essential items recommended by the WCA 2030 and relevant items needed to build the frames for the programme of agricultural surveys. The long questionnaire should encompass additional items to be collected from a sample of holdings (e.g., one every ten holdings or holdings within a sample of enumeration areas[3]) or holdings identified according to certain criteria, such as being above an established threshold or belonging to a particular segment of the population. Both the short and long questionnaires are completed during the same field visit and use the same time frame. The short-long questionnaire option is used to avoid burdening the census questionnaire with items that are not essential and therefore do not require data at the lowest administrative level. While the long questionnaire estimates are not based on full coverage, they are regarded as census output. The short questionnaire should not be confused with the listing form, which is used during the pre-census stage to merely identify holdings as households engaged in own-account agricultural production and above a certain size threshold. Likewise, the long questionnaire should not be confused with a supplementary module of the modular approach, which is thematic by definition and is implemented during another field visit after the implementation of the core module (see next section).

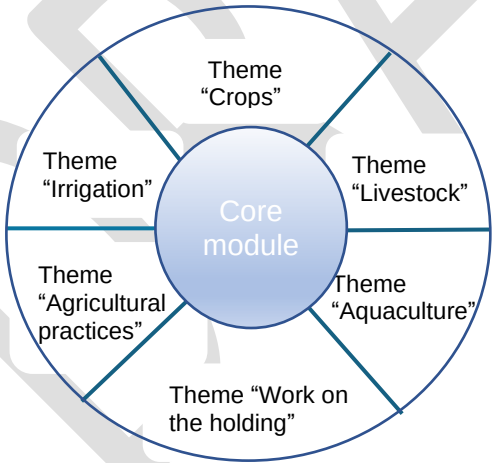
[3] The advantage of the first sampling method (i.e. one in ten holdings) over the second (i.e. sample of EAs) is that the sampling precision of results is greater because clustering effects increase the sampling variance when whole EAs are used as sampling units (UN, 2025d).

The modular approach

5.9 The modular approach has a clearly distinguishable core module and supplementary thematic module(s), using the items collected in the core module to create the frame for the sample-based supplementary thematic modules. This approach is suitable for countries that do not have a well-established system of agricultural surveys. These countries may find the modular approach as a logical first step towards the creation of a system of integrated agricultural censuses and surveys. In the absence of a survey programme, this approach enables the collection of a greater range of in-depth data (additional items) in the supplementary modules[4] using sampling methods to provide data not required at lower administrative levels. Chapter 11 of the Operational Guidelines (FAO, 2018a) provides practical details of the modular approach.

5.10 Indispensable conditions are that the core module should cover all essential items and that its data should be used as frames for the supplementary thematic modules. Supplementary thematic modules, in turn, are used to collect a more extensive range of data (additional items), under the same theme, from a subset of holdings or a specific target population. Examples of thematic modules include crops, livestock, and irrigation (see Figure 5.1). For example, a supplementary thematic module on livestock will include data items from the livestock theme to be collected from holdings that reported having livestock in the core module, while a supplementary thematic module on irrigation may concern only those holdings having irrigation. In some specific cases, items from several related themes can be combined into one module (e.g. crops and agricultural practices). The core module should be conducted on a complete enumeration basis while the supplementary thematic modules are conducted on a sample basis[5], usually completed at a second field visit.[6] Core and supplementary modules should be conducted in a short period of time (within one year after the other) to ensure valid frames from the core module and the same reference period for all census items. A core module conducted simultaneously with only one supplementary module is considered to be the short-long questionnaire concept and thus a classical approach.

Figure 5.1. An illustration of the modular approach - core and supplementary modules



Supplementary thematic modules*

*Sample supplementary thematic modules contain additional items. See Chapter 6 and Annex 4 for additional items under themes crops, livestock, irrigation, agricultural practices, work on the holding, and aquaculture.

[4] Please note that the supplementary modules correspond to the themes listed in Chapter 6 (additional items are described in Annex 4). For instance, a "supplementary module on crops" could include any of the 13 additional items listed under the Theme Crops.

[5] The sample design of each supplementary thematic module is elaborated as it involves the screening of the target population (e.g. holdings with livestock) and the use of stratification. Due to this, the supplementary thematic modules are usually conducted in a second field visit.

[6] The supplementary thematic modules should not be confused with the continuous programme of surveys. While the former are usually conducted only once after the core module as a single one-off operation, the latter are conducted regularly during the inter-censal period.

5.11 In the modular approach, the core module includes relevant items needed to build the frame for the subsequent sample-based supplementary thematic modules and all essential items recommended at the lowest administrative level, to capture data on rare events, to provide benchmarking data for current agricultural statistics, and to establish a threshold, if any. Thus, in the core module, all essential items and relevant items serving for frame building should be collected from all agricultural holdings.

5.12 The sample-based supplementary thematic modules use the frame generated from the core module to target specific populations. Examples can be all holdings, holdings above a certain size or subsets of agricultural holdings, such as livestock producers or crop producers – again, with or without size considerations. Supplementary thematic modules are used to collect a more extensive range of data compared with the classical approach. Modules are 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. Since the number and the extent of the supplementary thematic 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

5.13 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.

5.14 In most cases, registers cannot provide all the essential items, therefore the most reasonable approach is to combine data from registers with data from field enumeration. Essentially, the combined methodology makes use of registers relevant to the census, complemented by census/survey data. The use of census/survey data is intended to:

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

5.15 The combination of administrative records with census/surveys can offer several advantages:

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

5.16 The use of administrative records may pose some challenges, including:

i. Access to datasets is difficult or even impossible if the legal background is inadequate.
ii. It could be very difficult to establish a good cooperation with register owners.
iii. The cost for the access to the administrative records could be too high.
iv. Incoherence of concepts, definitions, classification, and reference periods could hamper the use of administrative sources.
v. There could be technical problems related to linking data from various data sources.

5.17 Regardless of the census methodology adopted, it is extremely important that a unique primary key variable or identifier 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). Special care must be taken in protecting the confidentiality of sensitive data from registers when the information is used for the census.

5.18 If not all holdings are visited because of the use of complete registers for some holdings, it is important that registers provide geographical coordinates to map the holdings (or their parcels or cadastral plots). See Georeferencing in Chapter 5.

Frames for the agricultural census

5.19 In a statistical collection, the frame is how 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.

5.20 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. holdings in the non-household sector, such as enterprises and other juridical holdings) and the remainder (e.g. other holdings) by an area frame (Global Strategy, 2015a). For the census of agriculture, the list frame is the most common frame used by countries.

5.21 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 when 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.

5.22 For the non-household sector (e.g., corporations, cooperatives, military, educational institutions, prisons, religious organizations, and government agencies), 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. When records are out of date or unreliable, such frames can also be created by asking local officials to provide lists of non-household agricultural units in their areas of responsibility. The community survey (see chapter 8) is a good opportunity to ask the community chief or other representatives of the community administration for the list of non-household and special holdings in the community (see paragraph 8.13).

5.23 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 landowner 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.

5.24 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 3). The population and housing census would include additional questions on agriculture to identify households involved in “own-account agricultural production” 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.

5.25 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.

5.26 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:

1. contact each household for the agricultural census.
2. 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
3. enumerate all agricultural holdings identified in the household for the agricultural census.

5.27 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.

5.28 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 Enumeration Areas (EAs), covering the whole in-scope national territory. Then each EA is visited to identify all agricultural holding units through interviews with local authorities or visits to each household. Population 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.

5.29 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, as explained above.

5.30 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. See Chapter 13 of the "Operational Guidelines" (FAO, 2018a) for more information about census frames.

Sampling for census modules

5.31 In the modular approach and in the short-long questionnaire concept under the classical approach, supplementary modules are implemented in subsets of holdings from the core module where particular variables of interest are collected. Whilst the core module is conducted on a complete enumeration basis, the supplementary modules are implemented by sampling. For example, the item 0502 "Number of animals for each livestock species" which is an essential item (in the core module) should be collected for all agricultural holdings but additional items 0505 "Number of animals per breed category", 0506 "Number of animals: age and sex" and 0507 "Number of animals according to purpose" that could compose a supplementary livestock module , could be collected , say, for one in every five holdings reporting livestock.

5.32 Sampling for supplementary modules can be done at the same time or in a posterior stage as closely as possible to the core module so that the frame can be readily used and the same reference period can be kept for all census items. The former situation assumes the use of CAPI and has the advantage of simplicity and saving costs because a second visit to selected holdings is not necessary. However, the latter allows the use of more information for improving the sampling design.

5.33 When supplementary modules are implemented along with the core module, the sampling design could be a systematic sampling selecting automatically with the CAPI application, one holding every k-holdings of the corresponding population of interest (all holdings or holdings with the main characteristic to be covered by the module). In this case, a screening variable is necessary. For example, for an irrigation module, every k-holdings using irrigation (screening question), one is sampled.

5.34 When supplementary modules are sampled in a subsequent stage, the information collected in the core module can be used for more complex sampling designs. A stratified sampling design could increase the precision of estimates for the parameters in the supplementary module or a design in two or more stages could reduce operational costs (see WCA 2020, Volume 2, Operational Guidelines, FAO, 2018a).

Quality assurance

5.35 Quality assurance is a process ensuring that quality goals are consistently met throughout the whole system of census data production. The major goal of a quality assurance framework for the census of agriculture is to prevent and minimize potential errors at the design stage and detect errors as soon as possible so that timely remedial actions can be taken even as the census operations continue. The focus should be to prevent errors from reoccurring, to detect errors efficiently, and to inform the staff concerned so that corrective actions are taken in a timely manner. Chapter 8 of the WCA 2020 Operational Guidelines (FAO, 2018a) discusses several important dimensions to consider towards ensuring quality in census data.

5.36 Under the dimension of accuracy and reliability, the Operational Guidelines highlight some primary areas of quality evaluation, namely:

- evaluation of coverage error, both undercoverage and overcoverage and response errors, usually done via the Post-enumeration Survey (PES; see Chapter 23 of the Operational Guidelines (FAO, 2018a));
- non-response rates and imputation rates;
- data capture error rates, coding error rates;
- measures of sampling error, when sampling is used for the census supplementary modules or the long questionnaires under the short-long questionnaire classical approach;
- any other serious accuracy or consistency problems with the results.

5.37 Quality is also a relative rather than an absolute concept from the user perspective. For example, for the census agency, accuracy may be the most important aspect while for a decision-maker, it may be timeliness in which the census results are released. Another important aspect is the cost or value for money associated with some dimensions of quality. This aspect is particularly important in developing countries with limited resources. The census of agriculture is a large and complex operation and non-sampling errors, such as coverage and content errors, when data are collected and processed, are unavoidable. It is therefore recommended to evaluate and inform the accuracy of data collected so census organizers are aware of its quality and users are aware of data limitations.

Methods of enumeration

Interviewing methods

5.38 This section provides a brief description of the commonly employed enumeration methods for agricultural censuses. The advent of advanced technologies like information technology, geographical information systems (GIS), and GPS has opened new avenues for data collection, promising enhanced efficiency and data quality. By harnessing advanced technologies, there is the potential to achieve improvements in various aspects of data quality, including timeliness, minimizing under coverage and response errors, as well as realizing cost efficiencies by reducing staffing and other expenses. More information about these methods, their strengths, and weaknesses is available in Chapter 20 of the Operational Guidelines (FAO, 2018a).

5.39 The traditional paper and pen method is being replaced by the use of mobile devices, online interviewing and post, and this trend is expected to continue.

5.40 Paper and Pen Interview (PAPI) - The PAPI is a conventional approach in which enumerators conducts face-to-face interviews with 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. In light of advancements in new technologies, there are opportunities to streamline and enhance data collection methods.

5.41 Methods using advanced technologies – During the last decades, developments in new technologies, particularly information and communication technologies and geo-referencing devices, provided 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 enterprises and other holdings in the non-household sector – 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 enterprises or government farms.

5.42 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 (by telephone, email, from the agriculture census website or post service in rural areas) to handle queries from respondents.

- Computer-Assisted Web -Interviewing (CAWI) - The CAWI 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. Computer and Web illiterate or visually impaired respondents might be discouraged to use CAWI.
- 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 enterprises 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 to data collection

5.43 Above it was discussed the use of technology in some enumeration methods, including the use of mobile devices, computer-assisted interviewing, and web interviewing. The use of technology in data collection for agricultural censuses has become increasingly prevalent, providing various complementary tools to enhance the efficiency and accuracy of enumeration methods. These technologies, as discussed in the Operational Guidelines of WCA 2020 (FAO, 2018a), offer valuable support throughout the data collection process. Artificial Intelligence (AI) and Machine Learning (ML) present opportunities to further enhance these processes.

5.44 **Remote sensing and aerial/orthophotos**: In the context of an agricultural census, remote sensing (RS) and aerial photos for agricultural statistics can be used for (i) cartography and frame building; (ii) supporting fieldwork; and (iii) crop area estimation. (For more details on the use of remote sensing for agricultural statistics) (Global Strategy, 2017).

5.45 **Handheld GPS devices**: Handheld GPS devices have gained prominence in census operations across many countries. These devices serve multiple purposes, including geo-referencing land plots, location tracking, and area measurement. They are particularly useful for building frames, and modern mobile data collection devices (e.g., smartphones and tablets) often include built-in GPS functionality, making them highly portable and suitable for geo-referencing holdings. These devices also help optimize logistical operations and enable enumerators to collect and compile paradata, facilitating effective monitoring of census progress.

5.46 **Drones**: Drones are emerging as a valuable tool for data collection, especially in remote or challenging terrain. They can capture aerial photographs and are employed to verify visual counts and correct for observer bias. Drones, including micro-drones, offer an alternative to manned flights used to gather aerial data and can be equipped with video or still cameras, making them useful for purposes such as livestock enumeration when the type of livestock system allows such aerial enumeration. However, their range is currently limited by battery autonomy.

5.47 **Social media**: Social media platforms such as WhatsApp can be used to maintain communication within enumeration teams in the field. Enumerators can raise questions in the chat or request assistance to the supervisors. Films and videos are one of the most useful aids for trainees to understand a subject. A film showing, for example, methods of interviewing holders, or agricultural and living conditions of the holders in the country, could be very effective in preparing trainees for fieldwork. These aids can be uploaded to social media platforms or to the Internet to be downloaded and reproduced at each training venue or for refreshing courses. Training courses can also be consulted anytime the trainees wish to do it. E-learning and online courses played a key role in the training of trainers, supervisors, and enumerators during the COVID-19 pandemic as countries went into lockdown. Countries that used e-learning during the training phase of the census coped better than others with the challenges posed by the pandemic.

5.48 **Artificial Intelligence (AI) and Machine Learning (ML)**: The integration of AI and ML in agricultural census activities can significantly enhance efficiency by automating traditionally labour-intensive tasks. AI-powered tools can streamline questionnaire design by analysing past data to suggest optimal formats, wording, and sequencing, ensuring questions are comprehensive and easy to understand. This reduces respondent burden and minimizes errors in data capture. Additionally, AI can transform the creation of supervisor and enumerator manuals by generating content that aligns with best practices and common field scenarios. Advanced natural language generation (NLG) models can produce user-friendly guides and procedural checklists, while personalized digital training

programs can simulate field situations for scalable, consistent training across large teams, thereby improving data collection accuracy and reliability.

5.49 Furthermore, AI-based project management systems can optimize resource allocation, schedule tasks, and monitor real-time progress, enhancing the coordination of complex logistics. These systems can predict and mitigate potential risks, such as weather disruptions or equipment shortages, by analysing historical data and environmental factors. Automating key administrative tasks allows teams to focus on strategic aspects of the census, ensuring smooth operations with fewer human errors. This not only improves data quality but also reduces operational costs, leading to higher-quality data and timelier outputs.

Georeferencing

5.50 An important factor that expands the coverage of the census of agriculture is the georeferencing of holdings. Item 0101 “Identification and location of agricultural holding” recommends georeferencing holdings. Holdings in the household sector could also be listed and georeferenced in advance during a recent population and household census or during the CA listing operation; these operations provide the frame for the agricultural census.

5.51 Global Positioning Systems (GPS) make it possible to find the geographic position of agricultural holdings, which has several advantages for the preparation of frames, planning of the fieldwork, presentation of results, and facilitating the integration of agricultural census data with other GIS databases, providing in this way a comprehensive view of the agricultural landscape.

5.52 The linkage of georeferenced census data to other available GIS databases is extremely useful and often in high demand by policy-makers and the large user community (UN, UN-GGIM and UNSC, 2019).[7] The linkage provides, for example, the opportunity to examine spatial patterns of the results of the implementation of policies, and to identify areas for government to further plan interventions and agribusiness opportunities for the private sector.

5.53 GIS databases continue to be increasingly used to illustrate the spatial distribution of various characteristics of agriculture. Different data such as average size of holdings, proportion of agricultural land, main crops, irrigated land, livestock, use of paid workers, use of inputs, agricultural practices, etc., can be shown for different political/administrative and geographic areas on maps using different colours or shades. With modern GIS software and equipment, production of such maps and other GIS products is more efficient and effective.

5.54 By linking data from agricultural holdings to geographical areas (and in some countries with datasets of population census and other surveys), GIS provides powerful data management functionalities in allowing users to explore, analyse, describe and communicate census results according to their information needs. This allows for monitoring, policy analysis, planning and research that can more readily identify policy and geographic priority areas and thus further facilitates evidence-based policy and decision-making at the subnational level.

5.55 Linking georeferenced agricultural census data with other GIS databases makes possible innovative analysis. If linked to a water resources database, one could analyse, for instance, environment implications of the use of irrigation and fertilizers. These cross-comparisons are, of course, possible for the lowest geographical level when the relevant census items (use of irrigation and fertilizers, in this example) are collected by complete enumeration.

Use of geospatial data to enhance census design and data collection

5.56 Earth observation (EO) is the gathering of information about the Earth's surface, waters and atmosphere via ground-based, airborne and/or satellite remote sensing platforms. EO is increasingly

[7] This linkage is closely aligned with Principle 3 of the UN Global Statistical Geospatial Framework (GSGF), which emphasizes the use of common geographies for the dissemination of statistics.

used in agricultural surveys and censuses to produce land cover (LC) and land use (LU) statistics. Existing LC and LU maps from national mapping authorities or from concerned line ministries can be used to extract areas classified as agriculture, cropland or other uses. In this exercise, it is important to inspect the metadata of the map and to ensure that the definition of the classes is in line and coherent with the definition of agricultural land[8]. Several countries are developing their technical capacity to produce their own national LC/LU maps using EO data. However, many still do not have this capacity and therefore can rely on existing global datasets.

5.57 Below are some examples of freely available global LC maps which can be used for this purpose (as of 2024):

1) European Space Agency CCI time series, 300 meters spatial resolution (1992 – 2020) (ESA, 2026a)
2) Copernicus Land Cover Dynamic Land Cover, 100 meters spatial resolution (2015-2019) (EU, 2026)
3) European Space Agency, WorldCover 2021, 10 meters spatial resolution (2021) (ESA, 2026b).

Benefits:

- the use of LC maps allows to rapidly identify the entire agricultural land at national level, ensuring that holdings in remote areas are considered. The maps can be used for census planning, ensuring that the total cropland is completely covered during the enumeration.
- they can be used to update any area frame in time as a result of LC changes taking place on the country. (e.g. expansion of agriculture to other areas previously used for other purposes).
- LC maps are subject to validation through ground truthing, hence the error and confidence intervals of the agricultural area derived from maps could be known.

Limitations:

- the definition of LC classes may not be aligned with the definition of the agricultural land.
- LC maps may be affected by commission (class pixels erroneously classified) and omission (pixels left out from the correct class) errors which at a global scale could be marginal. However, when only a portion of the map is used, e.g. the national territory of a given country, such errors may increase considerably. This may cause the exclusion of agricultural areas (omission) or the erroneous introduction of non-agricultural areas (commission).
- The spatial resolution of the map may not be high enough to correctly map the smallest holdings in a country. This may limit the inclusion of small holdings, resulting in the underestimation of the total agricultural area and underrepresentation of the smallholder class.
- The reference year of the map may be outdated compared to the reference year of the census.

5.58 Once the agriculture land of the country is mapped, it is possible to use any GIS software (e.g. QGIS[9]) to generate a regular grid and match it to the agricultural land. The pixels could be used to be characterized by homogeneous traits defined by EO data. It is also possible to derived EO-variables. A short list of possible EO-derived variables is provided below:

Agricultural Intensity. This variable is computed dividing the area of each pixel with the area of the pixel covered by agricultural land. This can be achieved using a basic overlay and zonal statistics operation in any GIS using the regular grid and a crop mask as inputs. A crop mask can be extracted from an existing national LC/LU map or from one of the global maps referenced in 5.54. A crop mask can be also produced from scratch using satellite data and field data and applying a supervised classification.

Phenology. In this context it is possible to create strata based on the crop calendars. For example, a group of pixels could represent areas where are dominant winter crops, summer crops, and multiple cycles irrigated/rainfed crops. The phenology of crops can be measured using a variety of time vegetation indexes per crop type that can be extracted from EO time series data, using open and free GIS software (QGIS) and free and open Remote Sensing (RS) data (e.g. Sentinel-2, Landsat 8, Modis). A largely used vegetation index is the Enhanced Vegetation Index (EVI) (see Henrich et al.,

[8] Agricultural land is the land area that is either arable or under permanent crops and pastures (see paragraph 7.2.14).
[9] QGIS is a free and open-source geographic information system software.

2012).

Georeferencing and EO data

5.59 There are three main approaches for georeferencing, namely the simplified georeferencing of the holding's household location (discussed in paragraphs 5. 51-5.52), and, when possible, the full georeferencing of the crop plots. The pros and cons of these approaches are described below. Both options can be combined to design the final protocol, weighting costs and accuracy.

- **Approach 1 – Simplified**
  The GPS is used to georeference the location of the holding's household (paragraphs 5.51-5.52).
  Strength: cost efficiency, minimization of time in the field.
  Weakness: the crop information provided by the holders through the interview will not be necessarily linked to the location of the crop fields. In this context, it is not possible to fully integrate census data with EO data. Furthermore, this approach does not allow to map the real extent of the holding (dwelling plus the agricultural land), and therefore it does not allow to use GIS functions to measure the area of the fields and compare with the area declared by the holder.

- **Approach 2 - Full**
  The GPS is used to georeference the crop parcel(s) associated with each holding[10].
  Strength: survey data is compatible for integration with EO data. This leads to higher accuracy in area estimation, and possibility to produce wall-to-wall crop type maps.
  Weakness: it is resource intensive, more suitable to surveys than to censuses of agriculture.

- **Approach 3 – Automated field boundary delineation using EO data**
  There is a new emerging method to reduce the time in the field under this scenario. It involves deskwork before going to the field, to develop a wall-to-wall digital map of field boundaries. The method uses digital maps of crop plots boundaries preloaded on the enumerator's tablets and connected to the CAPI app. During the interview, the map automatically zooms and pans to the location of the enumerator in the holding. The enumerator asks the holder to indicate on the map the parcels associated with his holding, and by simply clicking on the screen, the enumerator links the parcels to the holding and to relevant questions (e.g. crop type).

  Such maps should be developed ahead of the census fieldwork using satellite images and applying Artificial Intelligence (AI) tools such as computer vision or machine learning classifiers to detect the discontinuity between fields. Post-processing is also necessary to clean up errors and to filter out non-crop polygons[11]. Some examples of this approach can be seen in Masoud, K. M., Persello, C., and Tolpekin, V. A. (2020), FAO (2024a) and FAO (2026).

  Strengths: such approach drastically reduces the time in the field as enumerators do not need to walk to each parcel of the holding as they can visualize the plots on the tablet's screen. The method ensures maximum precision in area measurement at plot and at holding level.
  Weaknesses: the production of a national wall-to-wall map of crop field boundaries requires investment and specific technical capacity prior to the census (see paragraph 5.62). Furthermore, the map should be updated regularly and before a new census.

Estimating holding area using georeferenced data

5.60 It is possible to use a variety of proprietary and open-source GIS software to estimate the area of any parcel and the holding itself, using any of the three approaches discussed above (see paragraph 5.59). The area calculation function embedded in the GIS software requires that the user defines the geographic coordinate system used in the country and the area unit (e.g. ha). To compute the total area of the holding, the identification of the holding or holder must be linked to the corresponding plots or parcels belonging to the holding.

[10] This approach involves three methods: i) georeferencing the parcel boundaries and the parcel centroid; ii) georeferencing only the parcel boundaries; and ii) georeferencing only the parcel centroid. (Azzari et al., 2021).
[11] In 2024, the Brazilian Institute of Geography and Statistics (IBGE) was using this EO method to produce field boundary maps for the entire national territory for the reference year 2025. This effort faced some challenges, especially in accessing the adequate IT infrastructure needed for such massive computation.

5.61 The accuracy of the area estimation is directly dependent on the georeferencing approach used and the accuracy of the GPS device. The georeferencing of crop plots or parcels under the full georeferencing approach allows a better integration of the census data with EO data through the correct positional alignment of the crop parcel boundaries and/or centroid with the pixels of the satellite image. The use of remote sensing data can improve the precision of estimating crop areas by reducing uncertainty. This method provides useful secondary data, such as values from multiple sensor bands and computed vegetation indices, which are results of combining these bands. When this remote sensing data is combined with on-the-ground observations, it enhances the cost-effectiveness of statistical models used for estimating crop areas (Ambrosio,L. et al., 2023[12],FAO, 2015b; Gallego, F.G., 2004).

EO and the enhancement of census statistics

5.62 Thanks to the integration of census and EO data it is possible to set up a system to produce national wall-to-wall crop type maps at high spatial resolution (10 metres). Timely, accurate and granular crop type maps allow a series of applications which increase the usefulness of the census and enhance its impact on the overall quality of the national agricultural statistics. Using the census data as the baseline, crop type maps have some applications in successive years during the inter-censal period, which include:

- Crop area indicators. The development of crop type maps is straightforward and can be updated any year in the inter-censal period. This allows for the possibility to compute crop area statistics directly from the map and to provide an early area indicator, accompanied by error estimation. The area estimation is achieved by counting the pixels and after correcting the bias by the confusion matrix[13] developed during a map validation phase.

- Disaggregation of crop area at subnational level. The high spatial resolution (10 metres) of the updated crop type map, allows to compute area statistics at subnational level, at the smallest administrative unit. In this context, the crop type map can be used alone for disaggregation, or it can be used as a covariate in a small area estimator model jointly with field data.

- Development of accurate area frames. A national wall-to-wall crop type map updated for a specific inter-censal year can be used as a spatially explicit model of the crop area within the design of an area frame and the definition of strata (crop classes) so that and field sampling for surveys can be optimized, increasing accuracy and reducing time in the field.

Provisions for setting up EO systems

5.63 The production of crop type maps entails the establishment of a system supporting six basic functions:

1) Access to satellite images and to preprocess these to build an EO data cube.
2) The integration of in-situ data (e.g. holdings georeferenced during the census or parcels georeferenced on a sample basis) with EO data. This allows for the extraction of spectral features, such as EVI.
3) Training of a classification algorithm or machine learning (e.g. random forest, temporal neural network, dynamic time warping, etc).
4) Classification of the EO data cube into a crop type map.
5) Validation of the crop type map (ground truthing, confusion matrix).
6) When crop yield data is available from surveys (e.g. crop production surveys), the system also allow to run regression models for the early crop yield/production estimates.

5.64 The development of such a system implies the use of technology (software), data storage and computing capacity (one server and computers for the staff), specialized technical skills as well as data governance frame works and data confidentiality protocols. This system takes around two years to be set up and should be in place before the census cartographic work.

[12] Ambrosio,L. et al., (2023) shows that by using RS data in Senegal, the estimator accuracy improved considerably: the amplitude of the confidence interval decreased, and the estimation error was reduced by half.

[13] Confusion matrix is a two by two table that reports the number of true positives, false negatives, false positives, and true negatives.

5.65 While a mature EO based crop statistical system can be achieved in two years' time, through planning and investment of adequate resources, it is possible to start immediately with small incremental steps (e.g., sourcing of free LC maps and EO data) which are cost free, or low cost. This allows to demonstrate the usefulness of EO to produce crop statistics and the efficiency gains within the census agency, while developing the required skills and experience. This activity will likely require the full time of one statistician or data scientist with some basic understanding of remote sensing and mapping techniques. Use of free and open software and cloud computing services is recommended (Q-GIS, Google Earth Engine, Digital Earth Africa). Such activities could be put in place ideally one year before the preparation for the census.

5.66 Countries could refer to existing available EO online platforms which provide free access to EO big data and offer free computing resources within given user limits. Some of the existing free platforms are listed below:

- Digital Earth Africa,2026;
- OpenEO, 2026;
- System for Earth Observation Data Access, Processing and Analysis for Land Monitoring (SEPAL) (FAO, 2024b);
- The European Space Agency, Network Of Resources (NOR) (ESA, 2026c);
- Google Earth Engine (GEE, 2026). Although this is not an open platform, it does offer a free subscription for non-commercial use.

CHAPTER 6

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 12 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 7.

Introduction and changes from the earlier programme

6.1. 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 8.

6.2. The WCA 2020 programme classified the census items into three categories: essential items, frame items and additional items. In such a programme, there were 23 essential items (all to be included in the census), 15 frame items, some of which 6 were also essential ones, and 96 additional items more suitable for sample census modules or surveys

6.3. The WCA 2020 recommended that countries should focused on collecting all essential items (i.e. the minimum set of structural items that countries must collect), while regular agricultural sample surveys should focus on collecting non-structural items needed more frequently. The coverage of all essential items in the census enables national and international comparison.

6.4. The WCA 2030 continues with the distinction between “essential” items and “additional” items. The essential items are those that every country should collect by complete enumeration, regardless of the methodological approach used for the agricultural censuses, as they are needed for national purposes and international comparisons. Some of the essential items provide the frame for sample-based census supplementary modules (e.g. modules on crops, livestock or aquaculture in the modular approach) and/or the continuous programme of surveys (e.g., surveys on crop/livestock production or production prices). Additional items remain more suitable for sample census modules or surveys, although a few could be collected on complete enumeration basis only if needed at the lowest geographical or administrative level. Occasionally, some additional items could be collected by complete enumeration to be used as items for creating sampling frames (e.g., surveys on irrigation or crops under protective cover).

6.5. As explained in Chapter 1, WCA 2030 has introduced some new items, moved items to other themes, and removed some themes. In WCA 2030 there are a total of 123 items categorized as follows:

- 27 items are classified as essential (collected by complete enumeration), including those that serve for building frames for sample-based census supplementary modules and the continuous programme of surveys.
- 96 items are classified as additional (collected by sample enumeration). A few of them could be collected by complete enumeration if needed for national purposes or for creating sampling frames.

6.6. The 123 items are grouped into 12 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 0110 “Main purpose of production of the holding” is composed of “01” which represents the number of Theme 1 “Identification and general characteristics” and “10” which represents the 10th item in this theme.

6.7. All new items in the lists are marked with a “+”. For example, essential item 0402 is completely new and is marked with a “+” in the list of essential items below.

Essential items

6.8. There are 27 essential items. Essential 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 also required for international comparison purposes. Description is presented in Chapter 7.

List of recommended ESSENTIAL items ("+" denotes new item)

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
0106 Household size by sex and age groups
0107 Educational attainment of holder, spouse, and manager
0110 Main purpose of production of the holding
0111 Other economic activities of the household
0201 Total area of holding
0203 Area of holding according to land use types
0204 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 planted (for each temporary crop type)
0403 Area of temporary crops harvested (for each temporary crop type)
0408 Area of productive and non-productive permanent crops in compact plantations (for each permanent crop type)
0409 Number of permanent crop trees in scattered plantings (for each tree crop)
0413 Use of different types of fertilizing products
0501 Type of livestock production system
0502 Number of animals (for each livestock species)
0503 Number of female breeding animals (for each livestock species)
0601 Use of agricultural pesticides
0604 Selected machinery and equipment used on the holding by source
0901 Whether working on the holding is the main activity
0902 Working time on the holding
0903 Number of employees on the holding by working time and sex
0905 Use of contractors for work on the holding according to type of service
1001 Presence of aquaculture on the holding

Additional items

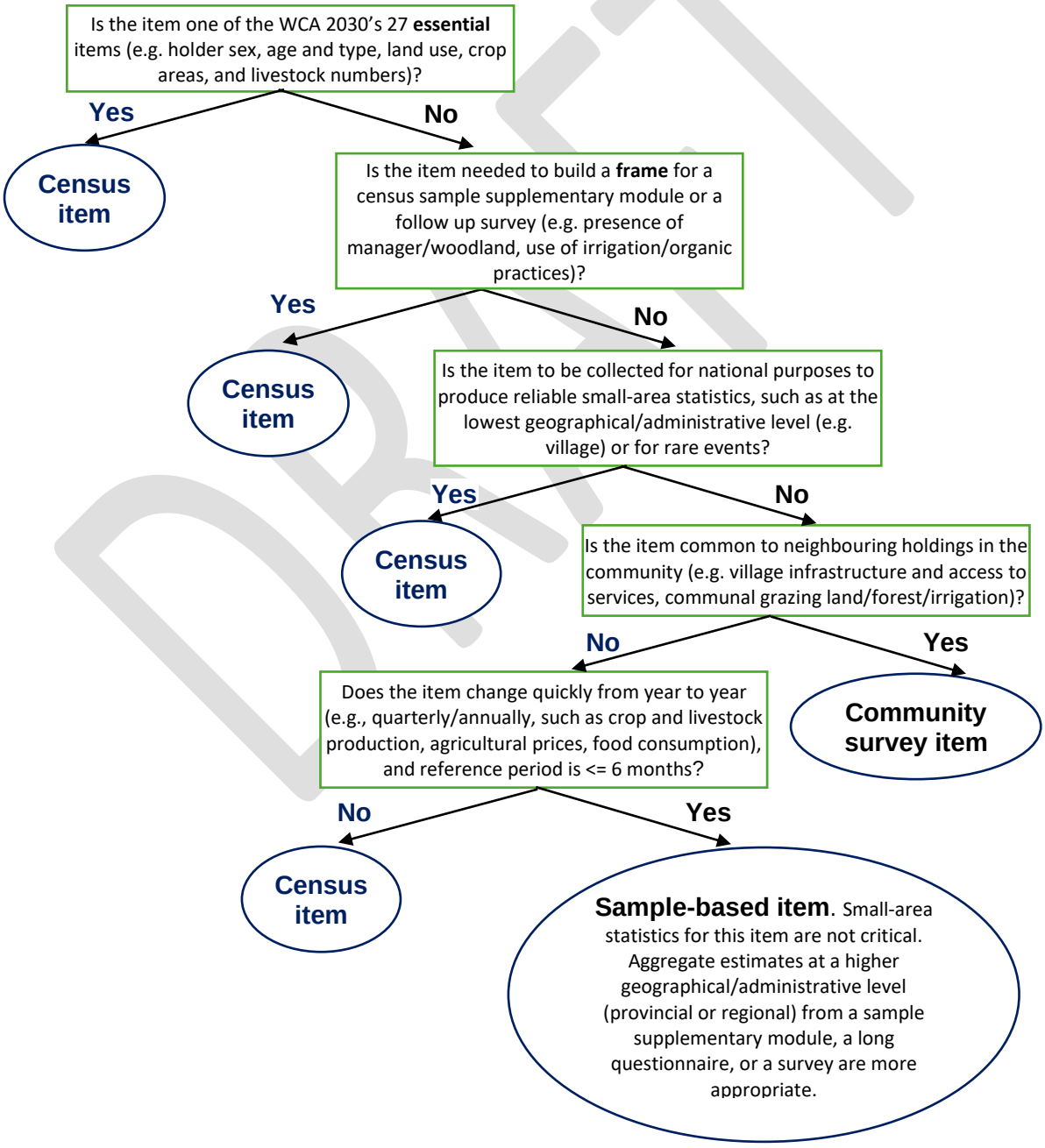
6.9. In Chapter 5 it was emphasized that FAO advocates for restricting agricultural census activities primarily to structural elements. The key components recommended for census coverage are identified as "essential". The remaining items are categorized as "additional" and are recommended to be preferably covered in surveys or supplementary modules under the modular approach or the long questionnaire in the short-long questionnaire concept under the classical approach. In countries with integrated census and survey programs, the agricultural census mainly collects structural slow-changing items while surveys mainly collect fast-changing additional items, which are non-structural. However, there are instances where the inclusion of non-structural items in the census becomes necessary. This is particularly relevant when the census serves as the sole opportunity to gather such data, such as in the absence of ongoing agricultural surveys. However, to the extent possible, additional items should be collected on a sample basis (e.g. in sample census modules) supported by the frame provided by the census to avoid overloading the questionnaires and burdening respondents.

6.10. The 96 items categorized as "additional" in the WCA 2030 are listed below under each theme, while their description is provided in Annex 4.

6.11. Regardless of the approach the country follows for census undertaken, the decision about whether and what additional items must be included in the census, if any, is an important choice at the

planning stages. In the classical approach, key additional items could be considered structural items because they are important for national comparison purposes or because they can provide frames for ad hoc and specific surveys, according to country requirements and resources. In the modular approach, in principle, essential and additional items serving for creating frames should be included in the core module and are generally enough for designing and implementing the supplementary modules. Additional items intended to provide more detailed data on a particular theme should be included in the supplementary modules that are collected on a sample basis. However, if the country considers that a few key additional items need to be collected at the lowest administrative level, for covering rare events, or for frames for ad hoc surveys, such items could be part of the core module, which is undertaken on a complete enumeration basis. Figure 6.1 shows a decision tree that countries are encouraged to use to support the decision on whether an item is a complete enumeration census item or, instead, a sample-based item to be placed in sample supplementary census modules (under the modular approach), in the long questionnaire (under the short-long questionnaire classical approach), or in surveys.

Figure 6.1 Decision tree for determining if an item is relevant for the census of agriculture



6.12. Annex 4 describe the additional items and identify some items that can provide frames for ad hoc and specific surveys.

Items for consideration by theme

6.13. The WCA 2030 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 1105 "Whether agroforestry is practised" is described under Theme 11 "Forestry" but is also relevant to Theme 6 "Agricultural practices". Thus, in Theme 6 a reference to Item 1105 "Whether agroforestry is practised" is made.

6.14. A "+" after item numbers denotes new items. For example, item 0402+ "Area of temporary crops planted" is a new essential item.

6.15. The scope of each theme is shown in italics letters under each heading when necessary (e.g., *for the holdings, for each parcel* and *for each livestock species*). Paragraph references to the applicable concepts and definitions of essential items in Chapter 7 are shown in parentheses after each item. As mentioned earlier, additional items are described in Annex 4.

Theme 1 – Identification and general characteristics

Essential items
For the holdings

0101 Identification and location of agricultural holding (paragraphs 7.1.1 - 7.1.5)

0103 Legal status of agricultural holder (type of holder) (paragraphs 7.1.6- 7.1.10)

0104 Sex of agricultural holder (paragraphs 7.1.11 -7.1.12).

0105 Age of agricultural holder (paragraphs 7.1.13 - 7.1.14)

0106 Household size by sex and age groups (paragraphs 7.1.15 - 7.1.17)

0107 Educational attainment of holder, spouse, and manager (paragraph 7.1.18 – 7.1.19)

0110 Main purpose of production of the holding (paragraphs 7.1.20 - 7.1.23)

0111 Other economic activities of the household (paragraphs 7.1.24 - 7.1.26)

Additional items (see Theme 1 in Annex 4)
For the holdings

0102 Respondent for the agricultural holding

0108 Agricultural training/education of the holder

0109 National/ethnic group of agricultural holder

0112 Proportion of income from holding's agricultural production in household's total income

0113 Main agricultural activity of the holding

0114 Presence of manager other than the holder

0115 Sex of manager other than the holder

0116 Age of manager other than the holder

Theme 2 – Land

Essential items
For the holdings

0201 Total area of holding (paragraphs 7.2.1 - 7.2.7)

0203 Area of holding according to land use types (paragraphs 7.2.8 - 7.2.37)

0204 Area of holding according to land tenure types (paragraphs 7.2.38 - 7.2.46)

Additional items (*See Theme 2 in Annex 4)*

For the holdings

0202+ Number of parcels

For each parcel

0205 Location

0206 Area

0207 Sex of household member managing the parcel

0208 Land use

0209 Land tenure

0210 Terms of rental (*for rented parcels)*

0211 Use of shifting cultivation

0212 Number of years since cleared

Theme 3 – Irrigation

Essential items

For the holdings

0302 Area of land actually irrigated: fully controlled and partially controlled irrigation (paragraphs 7.3.5 - 7.3.6)

Additional items (*See Theme 3 in Annex 4)*

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

0303 Area of land actually irrigated according to land use type: fully controlled and partially controlled irrigation

0304 Area of land actually irrigated according to method of irrigation: fully controlled irrigation

0305 Area of crops actually irrigated for each crop type: fully controlled irrigation

0306 Sources of irrigation water: fully controlled irrigation

0307 Payment terms for irrigation water: fully and partially controlled irrigation

0308 Use of other types of irrigation: partially controlled irrigation

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

0310 Presence of drainage equipment

Theme 4 – Crops

Essential items

Temporary Crops

0402+ Area of temporary crops planted (for each temporary crop type) (paragraphs 7.4.1 - 7.4.3.)

0403 Area of temporary crops harvested (for each temporary crop type) (paragraphs 7.4.4 - 7.4.15)

Permanent Crops

0408 Area of productive and non-productive permanent crops in compact plantations (for each permanent crop type) (paragraphs 7.4.16 - 7.4.20)

0409 Number of permanent crop trees in scattered plantings (for each tree crop) (paragraphs 7.4.21 - 7.4.22)

For the holdings

0413 Use of different types of fertilizing products (paragraphs 7.4.23 - 7.4.30)

Additional items - Temporary Crops (See Theme 4 in Annex 4)

0401 Types of temporary crops on the holding

0404 Area of temporary crops harvested according to end use (for each selected crop type)

0405 Production of temporary crops harvested (for each selected crop type)

0406+ Presence of hydroponic/vertical farming

Additional items - Permanent Crops (See Theme 4 in Annex 4)

0407 Types of permanent crops on the holding and whether in compact plantations

0410 Area of productive permanent crops in compact plantations according to end use (for each selected permanent crop type)

0411 Production of permanent crops (for each selected permanent crop type)

Additional items - For the holdings (See Theme 4 in Annex 4)

0412 Area of land used to grow temporary crops as a secondary land use

0414 Area fertilized for each type of fertilizer and major crop type

0415 Presence of nurseries

0416 Area of nurseries

0417 Presence of cropped land under protective cover

0418 Area of cropped land under protective cover

Theme 5 – Livestock

Essential items
For the holdings

0501 Type of livestock production system (paragraph 7.5.3)

For each livestock species

0502 Number of animals (paragraphs 7.5.4 - 7.5.6)

0503 Number of female breeding animals (paragraph 7.5.7)

Additional items - For each livestock species (*See Theme 5 in Annex 4)*

0504 Number of animals by sex of the household member managing them

0505+ Number of animals per breed category

0506 Number of animals: age and sex

0507 Number of animals according to purpose

0508 Number of milking animals according to milk status

0509 Number of animals born

0510 Number of animals acquired

0511 Number of animals slaughtered

0512 Number of animals disposed of

0513 Number of animals that have died from natural causes

0514 Types of feed

Additional items - For the holdings (*See Theme 5 in Annex 4)*

0515 Use of veterinary services

Theme 6 – Agricultural practices

Essential items
For the holdings

0601 Use of agricultural pesticides (paragraph 7.6.2-7.6.3)

0604 Selected machinery and equipment used on the holding by source

(paragraphs 7.6.4 - 7.6.6)

See item 0413	Use of different types of fertilizing products

Additional items (See Theme 6 in Annex 4)

0602	Use of seeds produced by modern biotechnologies.
0603	Use of seeds produced by modern biotechnologies according to crop type
0605	Non-residential buildings
0606	Percentage of each major agricultural product sold
0607	Use of organic agricultural practices.
0608	Type of seed for each major crop type
0609	Source of seed inputs for each major crop type
0610	Types of tillage practices
0611	Presence of conservation agriculture
0612	Presence of soil conservation practices
0613+	Use of technology on the holding
0614	Type of animal grazing practices
0615	Manure application
0616	Manure management system
See item 1105	Whether agroforestry is practised
See item 0301	Use of irrigation on the holding: fully and partially controlled irrigation
See item 0414	Area fertilized for each type of fertilizer and major crop type

Theme 7– Services for agriculture

Additional items (See Theme 7 in Annex 4)
For the holdings

0701	Receipt of credit for agricultural purposes
0702	Source of credit
0703	Type of collateral for credit
0704	Period of loan or credit
0705	Sources of agricultural information
0706	Sources of agricultural extension services used
0707	Travelling time to nearest periodic or permanent agricultural produce market for selling products
0708+	Type of insurance coverage

Theme 8 – Demographic and social characteristics

Additional items (*See Theme 8 in Annex 4)*
For each household member

0801	Sex
0802	Age
0803	Relationship to household head or other reference person
0804	Marital status
0805	Educational attainment for each household member excluding holder and spouse.

Theme 9 – Work on the holding

Essential items
For each household member of working age

0901 Whether working on the holding is the main activity (paragraph 7.9.9)

0902 Working time on the holding (paragraphs 7.9.10 - 7.9.14)

For the holdings

0903 Number of employees on the holding by working time and sex (paragraphs 7.9.15 - 7.9.20)

0905 Use of contractors for work on the holding according to type of service (paragraphs 7.9.21 - 7.9.24)

Additional items (See Theme 9 in Annex 4)

For the holdings

0904 Form of payment for employees

Theme 10 – Aquaculture

Essential items

For agriculture holdings or aquaculture holdings

1001 Presence of aquaculture on the holding (paragraphs 7.10.2 - 7.10.6)

Additional items (See Theme 10 in Annex 4)

1002 Area of aquaculture according to type of site

1003 Area of aquaculture according to type of production facility

1004 Type of water

1005 Sources of water for aquaculture

1006 Type of aquacultural organism cultivated

For the modular approach the reference group is holding with aquaculture production activities in essential item 1001

Theme 11 – Forestry

Additional items (See Theme 11 in Annex 4)

1101 Presence of woodland on the holding

1102 Area of woodland

1103 Purposes of woodland

1104+ Whether forestry activities are practised

1105 Whether agroforestry is practised

For the modular approach, the reference group is holdings with woodland (additional item 1101).

Theme 12 – Fisheries

Additional items (See Theme 12 in Annex 4)

1201 Engagement of household members in fishing activities

1202 Number of household members engaged in fishing activity by sex

1203 Number of fishers employed by the household by sex

1204 Access arrangements for fishing

1205 Main purpose of household fishing activity

1206 Type of fishing vessel used by source

1207 Type of fishing gear used

For the modular approach, the reference group is households with fishing activities in additional item 1201.

Community-level items

6.16. In addition to items collected at holding level the WCA 2030 also proposes items to be collected at community level (see Chapter 8). 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 2030 recommends the following items:

Geography

2101	Location (paragraph 8.20)
2102	Agro-ecological, climatic, topographical or soil types (paragraph 8.21)
2103	Land use (paragraph 8.22)
2104	Area of communal grazing land (paragraphs 8.23 - 8.24)
2105	Area of communal forest (paragraphs 8.23 - 8.24)
2106	Communal area under water used for aquaculture (paragraph 8.23 - 8.24)
2107	Travelling time and the associated mode of travel to the nearest major urban centre (by season, if applicable) (paragraph 8.25)
2108	Whether the community has year-round access to the nearest urban centre by a motorable road (paragraph 8.25)
2109	Whether the community is prone to natural disasters, such as droughts and floods (if applicable) (paragraph 8.26)

Socio-economic conditions

2201	Population according to population group (paragraph 8.27)
2202	Number of households (paragraph 8.27)
2203	Economic status (if applicable) (paragraph 8.28)
2204	Main economic activities (paragraph 8.29)
2205	Whether there are seasonal food shortages (if applicable) (paragraph 8.30)

Community infrastructure and services (See paragraph 8.31)

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

	Presence of specific development projects in the community *(See paragraph*
2401	*8.32)*

CHAPTER 7

DESCRIPTION OF ESSENTIAL ITEMS

This chapter contains a description of the themes and concepts and definitions for the agricultural census items given in Chapter 6, focusing on essential items, which are the items recommended for the census of agriculture. Additional items are discussed in Annex 4. The concepts and definitions have been developed taking into consideration international standards and the need for comparability with previous agricultural censuses and with other data sources. Any major changes from previous programmes are highlighted. Countries will need to adapt the concepts and definitions given to meet their own needs and circumstances.

Introduction

7.1 This chapter provides a description of the themes and concepts and definitions for the essential census items shown in Chapter 6. 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 previously used, unless a new international standard has been adopted.

7.2 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.

7.3 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.

7.4 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 4, paragraphs 4.35 – 4.36). 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 item. Reference period: census reference day.

7.1.1 Identification of agricultural holding usually includes holding's name and administrative unit code, 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.

7.1.2 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 additional item 0205, Annex 4).

7.1.3 Identification and location of the holding also play an important role when building sampling frames for sample census modules or ongoing sampling surveys. A list frame of holdings should contain clear identification and precise locations to facilitate the sample design and reach the sampled units.

7.1.4 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.

7.1.5 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.

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

7.1.6 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 a legal perspective, 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 two 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 Table 9.1 in Chapter 9).

7.1.7 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.

7.1.8 ***Household sector*** holdings are those 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.

7.1.9 ***Non-household sector*** holdings are those that do not belong to 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, religious institutions, and government, which comprise agricultural production entities operated by a central or local government directly or through a special body.

7.1.10 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

7.1.11 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. Every holder's sex (male or female) should be registered in the census questionnaire. According to 'Principles and Recommendations for Population and Housing Censuses'' (UN, 2025d, paragraph 5.168) some countries have started collecting data on gender identity in addition to information on sex of individuals to allow respondents to express their identity beyond traditional binary options. However, there are no international standards for measuring this fluid and evolving concept. The item 0104 is also important for analysing the gender aspects of agricultural production management and could also be useful as the basis for a sampling frame for special gender surveys.

7.1.12 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 manager is collected (see Item 0115) and where there are joint holders in a holding in the household sector, the sex of each holder should be reported. For the definition of an agricultural holder, see paragraphs 4.19-4.22. See Table 9.1 in Chapter 9 for information on how to tabulate sex of holder data.

0105 AGE OF AGRICULTURAL HOLDER

Essential item. Reference period: census reference day

7.1.13 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. This item could be useful as a stratification variable for ongoing surveys.

7.1.14 Age refers to the interval between the date of birth and the date of the census, expressed in completed solar years (UN, 2025d, paragraph 5.169). This item is collected only for holdings in the household sector. 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 4.19-4.22. See Table 9.1 in Chapter 9 for information on how to tabulate age of holder data. For holdings in the non-household sector (corporations, government institutions, etc.) the age of the manager is collected (see Item 0116).

0106 HOUSEHOLD SIZE BY SEX AND AGE GROUPS

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

7.1.15 Household size by sex and age groups refers to the number of members of the holder's household, classified by sex and age groups (see Table 9.1 in Chapter 9 for information on how to tabulate data 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 groups 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 4.4).

7.1.16 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 juridical holdings (e.g. different from civil persons) 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.

7.1.17 Household size can be measured in two ways: (i) persons present on the census reference day; 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 (for definition of the usual residence concept and treatment of special cases see UN, 2025d, paragraphs 2.48-2.64, 4.36-4.43).

0107 EDUCATIONAL ATTAINMENT OF HOLDER, SPOUSE AND MANAGER

Essential item. Reference period: census reference day

7.1.18 Educational attainment data are useful in an agricultural census to examine the effects of education on characteristics such as cropping systems and agricultural practices. Educational attainment refers to the highest grade of formal education successfully completed by a person. In the agricultural census, educational attainment data should include the agricultural holder, the agricultural holder's spouse and the manager, if present, as the educational levels of all can be important factors in agricultural and household activities.

7.1.19 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 four levels of education (UNESCO, 2011, paragraph 89, table 1): less than primary (for persons not having successfully completed primary education) primary, secondary (comprising lower and upper secondary education levels), and post-secondary (comprising post-secondary non-tertiary education, short-cycle tertiary education, bachelor's or equivalent level, master's or equivalent level, doctoral or equivalent level). Each level may be further subdivided to meet national needs.

0110 MAIN PURPOSE OF PRODUCTION OF THE HOLDING

- *Producing mainly for own consumption*
- *Producing mainly for sale*

Essential item. Reference period: census reference year.

7.1.20 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.). The most appropriate reference period is the census reference year, however in some countries with several harvesting seasons during a year alternative reference periods could also be suitable.

7.1.21 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 (see additional items 0112 and 0606, Annex 4).

7.1.22 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. For this purpose, and in line with AGRISurvey (FAO, 2018b, Annex 2-1, section 3) the following 4-item classification would be appropriate:

- Producing primarily for sale (selling 90 percent or more)
- Producing mainly for sale, with some own consumption (selling more than 50 percent and up to 90 percent)
- Producing mainly for own consumption, with some sales (selling more than 10 percent and up to 50 percent)
- Producing primarily for own consumption (selling 10 percent or less)

7.1.23 One use of the item is for developing a frame for a survey of farm food stocks for sale, in which case the item should be collected together with additional item 0605 (Non-residential buildings) (See Annex 4) and the above categories should be used.

0111 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 item. Reference period: census reference year

7.1.24 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 0111 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.

7.1.25 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.

7.1.26 The activity categories listed above are based on ISIC (Rev. 5) codes (UN, 2025a), 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. 5), including activities related to construction and transportation.

Theme 2: Land

0201 TOTAL AREA OF HOLDING

Essential item. Reference period: census reference day

7.2.1 The 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 household members but rented to others should not be included in the holding area. Conversely, land not owned by members of a household but rented from others for agricultural production purposes should be included in the holding area.

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

- land used for cultivation of crops (temporary and permanent, including cropped land under protective cover, see Annex 4, theme 4, paragraph 25), 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 growing on it.

7.2.3 The total 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.

7.2.4 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. Total holding area is very important in sampling frames for census supplementary modules and ongoing surveys as a stratification variable. More information on defining holding units when land is located in more than one administrative unit is presented in paragraph 4.12. Often, land data are collected parcel by parcel and the total area of holding is derived by adding the area of each parcel.

7.2.5 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 8.

7.2.6 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 4.15 for more information.

7.2.7 The most common method for collecting data on parcel and total holding areas in the census of agriculture is by holder declaration. In some countries, holders may not be able to provide reliable estimates of crop areas. To address this problem, when countries count with additional resources employ alternative methods in sample surveys, such as objective measurement in which the area is measured using GPS devices, including involving remote sensing (see paragraphs 5.44-5.45 and 5.62-5.64). The accuracy of crop areas could be improved if both declared areas and objective measurements could be drawn from a sample, where a correction factor may be constructed based on their correlation (see Chapter 20 of the Operational Guidelines, FAO, 2018a; Global Strategy, 2018; and David, 1978, for more details).

0203 AREA OF HOLDING ACCORDING TO LAND USE TYPES

Essential item. Reference period: census reference year

7.2.8 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 7.2.6), in determining land use reference is made to the activities carried out during the census reference year.

7.2.9 The internationally accepted standard for land use is the FAO land use classification (FAO, 2024c) , which served as the basis for the interim land use classes of the System of Environmental-Economic Accounting (SEEA) Central Framework, adopted by the UNSC in 2012, and the SEEA Agriculture Forestry and Fisheries (AFF), accepted as an internationally recognized methodological document in support of the SEEA, in 2018. The land use classes recommended in these guidelines are harmonized with the FAO land use classification (see Annex 5).

7.2.10 In its basic form, the FAO 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 FAO and 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 FAO land use classes also cover areas not in use in order to provide a complete accounting of the land within a country.

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

7.2.12 The FAO land use classes are designed to cover 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.

7.2.13 Definitions of these land use classes are given in paragraphs 7.2.18 - 7.2.37. The area of the holding is classified according to its main land use. See paragraph 7.2.17 for more information about main land use.

7.2.14 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 2030. The relationship of the basic land use classes recommended by WCA 2030 to the relevant categories/classes of the SEEA land use classification is presented in Annex 5.

Figure 7.1: Classification of land use (LU) for the agricultural census

<table>
<tr><th>Basic land use classes</th><th colspan="4">Aggregate land use classes</th></tr>
<tr><td>LU1. Land under temporary crops</td><td rowspan="3">LU1-3.
Arable land</td><td rowspan="4">LU1-4.
Cropland</td><td rowspan="5">LU1-5.
Agricultural land</td><td rowspan="6">LU1-6.
Land used for agriculture</td></tr>
<tr><td>LU2. Land under temporary meadows and pastures</td></tr>
<tr><td>LU3. Land temporarily fallow</td></tr>
<tr><td colspan="2">LU4. Land under permanent crops</td></tr>
<tr><td colspan="3">LU5. Land under permanent meadows and pastures</td></tr>
<tr><td colspan="4">LU6. Land under farm buildings and farmyards</td></tr>
<tr><td colspan="5">LU7. Forest and other wooded land</td></tr>
<tr><td colspan="5">LU8. Area used for aquaculture (including inland and coastal waters if part of the holding)</td></tr>
<tr><td colspan="5">LU9. Other area not elsewhere classified</td></tr>
</table>

7.2.15 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 (see Annex 5). 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.

7.2.16 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.

7.2.17 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 7.4.20), 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 and, aquaculture/agriculture combinations. In cases where the value of production may not be a proper criterion (as in forestry), for an associated combination such as agriculture/forestry the main use could be determined based on the primary purpose of the land area. Where agriculture, aquaculture or forestry activities are carried out on the same land jointly with 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.

7.2.18 Land under temporary crops includes all land used for crops with a less than one-year growing cycle which 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, e.g., asparagus and sugar cane (see ISIC Group 011 in Annex 2). Multiple/successive cropped areas are counted only once.

7.2.19 Annex 6 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.

7.2.20 The area of land under temporary crops refers to the physical areas of land on which temporary crops are grown. When measuring area of land used under temporary crops, it is appropriate to consider the gross area i.e. area including uncultivated patches, bunds, foot paths, ditches, headlands, shoulders and shelter beds instead of net area that excludes them. To learn more about the difference between 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)”.

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

7.2.22 Land temporarily fallow refers to land that is not seeded for one or more growing seasons. The maximum idle period is usually less than five years. This land may be in the form sown for the exclusive production of green manure. 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.

7.2.23 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.

7.2.24 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 is usually less than five years. 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.

7.2.25 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 meadows and pastures are excluded from Permanent crops.

7.2.26 The ICC is provided in Annex 6, with the specification of permanent crops (see also paragraph 7.2.19).

7.2.27 Land under permanent meadows and pastures includes land used permanently (growth cycle of five years or more) to grow herbaceous forage crops, through cultivation or naturally (as wild prairie or grazing land). Permanent meadows and pastures on which trees and shrubs are grown should be recorded under this heading only if the growing of forage crops is the most important use of the area. Measures may be taken to keep or increase productivity of the land (i.e., use of fertilizers, mowing or systematic grazing by domestic animals.) This class includes:

- Grazing in wooded areas (agroforestry areas, for example)
- Grazing in shrubby zones (heath, maquis, garigue)
- Grassland in the plain or low mountain areas used for grazing: land crossed during transhumance where the animals spend a part of the year (approximately 100 days) without returning to the holding in the evening: mountain and subalpine meadows and similar; and steppes and dry meadows used for pasture.

7.2.28 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.

7.2.29 Land under farm buildings and farmyards refers to land used for agriculture occupied by dwellings on farms: dwellings, operating buildings (hangars, barns, cellars, greenhouses, silos), buildings for animal production (stables, cow sheds, pig sheds, sheep pens, poultry yards) and farmyards. It includes land used for growing temporary or permanent crops under protective cover. It also includes land used for family or kitchen gardens. Area under the holder’s house (including the yard around it) is also classified here if it makes up part of the agricultural holding. It excludes buildings for agro-food manufacture and buildings in rural areas for exclusive residential purpose. (see paragraph 7.2.5).

7.2.30 Forest and other wooded land is land not classified as “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[14] with: (i) trees higher than 5 m and a canopy cover of 5 to 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.

7.2.31 Forest or other wooded land spanning less than 0.5 ha and that are not on land classified as agricultural land 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.

7.2.32 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.

7.2.33 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.

7.2.34 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 (see paragraph 7.10.3). Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc.

7.2.35 According to national circumstances, countries may wish to further subdivide this class into three subclasses in line with the FAO Land Use Classification (see Annex 5), 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 Annex 4, additional item 1002, paragraphs 2 and 3 under Theme 10 Aquaculture.

7.2.36 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 7.2.30); 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.).

7.2.37 FAO's recommended land use classification in the Figure 7.1 includes the following aggregate classes:

– Arable land is land used for cultivation of crops in rotation with fallow, meadows and pastures within cycles of up to five years. It includes the total of areas under "Temporary crops", "Temporary meadows and pastures" and "Temporary fallow". Arable land does not include land under permanent crops or land that is potentially cultivable but is not normally cultivated.

[14] This minimum threshold is introduced for harmonization with the definition of the "forest land" and "other wooded land" in the FAO land use classification.

– 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".

0204 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 (including rent-free)*
    - *Rented-in, leased or sharecropped with written agreement*
    - *Rented-in, leased or sharecropped without written agreement*
- *Other types of land tenure, including*
    - *State or common land used with written agreement (certified use rights)*
    - *State or common land used without written agreement (uncertified use rights)*
    - *Occupied/squatted without any permission*

Essential item. Reference period: census reference day

7.2.38 Item 0204 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 4.17). Land tenure refers to the arrangements or rights under which the holder operates the land making up the holding. 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.

7.2.39 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.

Optionally, the country may ask about the person or persons who own the land. This information is important for calculating SDG indicator 5.a.1 (See Annex 11).

7.2.40 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.

7.2.41 Rented land from someone else means that the holding rented or leased land 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.

7.2.42 Rental arrangements may take different forms:

– Land rented for an agreed sum of money and/or produce is usually the result of a straightforward transaction between the owner of the land and the holder, who takes responsibility for managing and operating the land.

– Share of the produce, 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 the 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.

7.2.43 There are various other types of land tenure:

– 'Common land' is an agricultural area used by the agricultural holding but not belonging directly to it, i.e. on which common rights apply. They are normally under the responsibility of 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. Common land consists mainly of permanent grassland, although it could also consist of horticulture or arable land. Usually, a large portion of these areas are used for grazing animals.

– Land operated on a squatter basis – that is, private or public land operated without ownership title and without the owner's consent.

– 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.

7.2.44 In case of use of the common land by several holdings for agricultural production, it should be allocated to the respective holdings (in the same manner that rented land is no longer considered as part of the holding of the owner, but as part of the holding of the tenant).

7.2.45 The area of common land assigned to a particular holding should be determined proportionally. This option is recommended if there is a guarantee of no double counting of the area.

7.2.46 Holdings report all the categories to describe the tenure of the land used by the holding. Possible multiple responses provided by holdings have to be clearly tabulated as one tenure or two and more in the census report.

Theme 3: Irrigation

7.3.1 Irrigation refers to intentional supply of water to the land, other than rain, to improve 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 irrigation 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.

7.3.2 Irrigation includes any process by which water is moved from a water source to be applied to an agricultural crop. Water for irrigation may come from various sources, including rivers, dams or wells, and from non-conventional sources (wastewater, desalinated water). 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.

7.3.3 Irrigation covers fully controlled and partially controlled irrigation. “Fully controlled” irrigation refers to surface, sprinkler and localized irrigation methods. “Partially controlled” irrigation refers to controlling flood waters to irrigate crops (spate irrigation) or to equipped lowlands (including water control methods in wetland areas and inland valley bottoms, and flood recession cultivation). Items 0302 and additional items 0301, 0303, 0307 and 0309 are applicable to both fully and partially controlled irrigation, additional items 0304, 0305, and 0306 are relevant to fully controlled irrigation methods and additional item 0308 to partially controlled irrigation methods (additional items are described in Annex 4).

7.3.4 Items 0301 to 0308 refer to the actual use of irrigation, not 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 the holding may not use these facilities 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. Additional item 0309 refers to area equipped for irrigation while additional item 0310 refers to the presence of drainage equipment on the holding (see Annex 4). Both items are important for sample surveys on the presence of irrigation and drainage equipment.

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

7.3.5 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. Additional item 0305 deals with the area of crops actually irrigated (see Annex 4). Area actually irrigated is very important in sampling frames for a census supplementary module and ongoing surveys on irrigation as a stratification variable.

7.3.6 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.

Theme 4: Crops

0402 AREA OF TEMPORARY CROPS PLANTED (for each temporary crop type)

Essential item. Reference period: census reference year

7.4.1 In this new item, area planted refers to the total physical area on which the sowing and planting has been carried out on the soil prepared for that purpose during the reference year and at least one time. It could happen that the same area is planted two or more times in the case of successive cropping or during two different seasons. In these cases, the planted area should be counted only once. The criteria to be considered when assigning a crop to a planted area in the case of successive crops could be the crop with the biggest crop value or the one which occupied the area for the longest time.

7.4.2 In the case of inter-cropping, mixed cropping or associated crops, the criterium for sharing the planted area between the crops could be the same explained in item 0403 below (see paragraphs 7.4.11 to 7.4.15). 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. It is recommended that, where possible, the area planted of such crop mixtures should also be sub-divided into their unitary crops to enable international comparisons to be made for planted areas.

7.4.3 As mentioned in paragraph 7.2.7, in some countries, holders may not be able to provide reliable estimates of crop areas. Alternative methods are sometimes employed in sample surveys, such as objective measurement to improve the declared crop areas in the census by calculating correction factors.

0403 AREA OF TEMPORARY CROPS HARVESTED (for each temporary crop type)

Essential item. Reference period: census reference year

7.4.4 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, percentage of area lost due to extreme events (droughts, floods, etc.) – could be used to determine if a crop was 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.

7.4.5 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 Annex 4, theme 4, paragraphs 22-23). 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.

7.4.6 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.

7.4.7 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.

7.4.8 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.

7.4.9 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 only once. 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.

7.4.10 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.

7.4.11 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.

7.4.12 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.

7.4.13 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 7.4.28 for more information.

7.4.14 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.

7.4.15 Countries could compare area of crops planted (item 0402) and area of crops harvested (item 0403) to assess crop loss. In cases when holders cannot provide reliable estimates of crop areas, please refer to paragraph 7.2.7.

0408 AREA OF PRODUCTIVE AND NON-PRODUCTIVE PERMANENT CROPS IN COMPACT PLANTATIONS (for each permanent crop type)

Essential item. Reference period: census reference day

7.4.16 Permanent crops are crops with a more than one-year growing cycle (see paragraph 7.2.25). For help in identifying crops, see Annexes 6 and 7. For the definition of a compact plantation, see Annex 4, theme 4, paragraph 13).

7.4.17 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 Annex 4, theme 4, paragraph 22). In addition to area, some countries may also wish to collect data on the number of permanent crop trees in compact plantations.

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

7.4.19 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 7.4.11 -7.4.12).

7.4.20 Special procedures are needed to measure areas where permanent crops are grown in a compact plantation in association with temporary crops (see also paragraph 7.4.13). 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 7.4.11 - 7.4.12). 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.

0409 NUMBER OF PERMANENT CROP TREES IN SCATTERED PLANTINGS (for each tree crop)

Essential item. Reference period: census reference day

7.4.21 Item 0409 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 6). Countries may wish to include other permanent crops, if suitable. Nurseries are excluded (see Annex 4, theme 4, paragraphs 22-23).

7.4.22 For the definition of permanent crops, see paragraph 7.4.16. For help in identifying crops, see Annexes 6 and 7. 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.

0413 USE OF DIFFERENT TYPES OF FERTILIZING PRODUCTS (for the holding)

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

Essential item. Reference period: census reference year.

7.4.23 For the purposes of the agricultural census, fertilizers refer 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, P_2O_5 and K_20). 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.

7.4.24 Mineral fertilizers are nutrient-rich fertilizing products 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”.

7.4.25 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.

7.4.26 Organic fertilizers are carbon-rich fertilizing products 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”.

7.4.27 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 a broad term used for products containing living or dormant micro-organisms such as bacteria, fungi, actinomycetes and algae, alone or in combination, which on application help in fixing atmospheric nitrogen or solubilize (mobilize) the soil nutrients (FAO, 2019).

7.4.28 Animal manure is material prepared from livestock production operations used for fertilization purposes. 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. Manures contribute to the fertility of the soil by adding organic matter and nutrients, such as nitrogen, phosphorus, potassium, and micronutrients.

7.4.29 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 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) (FAO, 2011) 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. Compost consists of organic materials of animal, plant or human origin partially decomposed through fermentation. Sewage sludge is residual organic material derived from sewage.

7.4.30 Biostimulants are products that stimulate plant growth through the synthesis of growth-promoting substances and/or plant nutrition processes independently of nutrient content, with the aim of improving one or more of: the plants’ nutrient use efficiency or uptake; plant tolerance to abiotic stress; or crop quality traits (FAO, 2019).

Theme 5: Livestock

7.5.1 Livestock refers to all animals, birds and insects kept or reared in captivity mainly for agricultural purposes. This includes terrestrial species such as cattle, buffaloes, horses and other equine animals, camels, sheep, goats and pigs, as well as avian species (i.e. poultry), bees (counted on the basis of number of bee colonies), silkworms, etc. (see Annex 8). 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 3.0 (UN, 2025b).

7.5.2 This theme should cover all livestock as described in paragraph 7.5.1 that are being raised on the holding. Reference should be made to the list of livestock species given in Annex 8. Sometimes, a country may wish to subdivide an important livestock species by breed or its adaptation to local conditions (i.e. livestock types); for example, chickens may be split into locally adapted and exotic breeds.

0501 TYPE OF LIVESTOCK PRODUCTION SYSTEM (for the holding)

- *Integrated crop-livestock production systems/mixed systems*
- *Specialized livestock production systems*
  - *Landless livestock production systems*
    - *Landless backyard livestock production system*
    - *Landless intensive livestock production system*
  - *Grassland-based livestock production systems/grazing system*
    - *Pastoralism*
    - *Ranching*

Essential item. Reference period: census reference day

7.5.3 The livestock production system (LPS) refers to the general characteristics and practices of raising livestock on the holding. There are large variations in the scale and intensity of livestock production 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:

1. **Integrated crop-livestock production systems or "mixed" LPS** are those in which either 10 percent or more of the dry matter fed to animals comes from crop by-products or stubble, or 10 percent or more of the total value of production comes from non-livestock farming activities (Seré and Steinfeld, 1996), or those where 15 percent or more of the land area has to be dedicated to cropping (Teufel et al., 2010). Moreover, mixed systems are found in areas dominated by cropland or areas with growing period of 60 days or more and human density 20 people or more per km^2 (see Global Livestock Environmental Assessment Model (GLEAM) in FAO, 2022b).

2. **Specialized livestock production systems**

   2.1 Landless livestock production systems are those in which less than 10 percent of the dry matter fed to animals is farm-produced and in which annual average stocking rates are less than 10 livestock units (LSU) per hectare of agricultural land (Seré and Steinfeld, 1996). They can be found in all agro-ecological zones where livestock rearing depends on external feed resources and where on-farm feed production is nil (Teufel et al., 2010). LSU is a reference unit that is used to make different species comparable and to calculate stocking densities of all different species together in one single value. In GLEAM (FAO, 2022b), the reference unit that is used to calculate LSU is based on the weight of a North American dairy cow (1.0 LSU) and takes into account the variations in weights for different cohorts (based on the calculated herd structure).

   2.1.1 Landless backyard livestock production systems are those where farmers keep a few LSU (1 to 5) mainly used for family needs which are fed with material coming from outside the farm or internal by-products with extensive management.

   2.1.2 Landless intensive livestock production systems are high-external input dependent and (sometimes called industrial) systems; examples include cattle feedlots systems (FAO, 2022c). An emerging type of landless intensive livestock production systems are so-called vertical systems which are fully independent from the natural environment. This includes vertical farming of poultry, which involves raising domestic birds, such as chickens or quails, in multi-tiered structures designed to optimize space and resources.

   2.2 Grassland-based livestock production systems are those where at least 10 percent of

the dry matter fed to animals is farm-produced and the annual average stocking rates are 10 or less LSU per hectare of agricultural land (Seré and Steinfeld, 1996), Notenbaert et al. (2009) defines grassland based with a cropland coverage of at least 10 percent of the total land area. Grassland-based livestock production systems are found in areas dominated by pastures and rangelands with short growing period (less than 60 days) or very low human density (20 people or less per km^2) (FAO, 2022c). Grassland-based systems include pastoralism (Notenbaert et al., 2009) and ranching:) and ranching:

2.2.1 Pastoralism (FAO, 2001): differentiated depending on the level of migration:

a. mobile pastoralism or nomadic pastoralism (usually no established home-base, humans migrate with their animals following availability of natural sources);
b. transhumance (seasonal migration of animals and herd-splitting); and
c. agropastoralism and silvo-pastoralism (no human migration, feed supplementation from crop and/or tree production).

2.2.2 Ranching: no human migration, land control with land boundaries and commercial purposes.

0502 NUMBER OF ANIMALS (for each livestock species)

Essential item. Reference period: census reference day

7.5.4 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-related census supplementary modules and surveys.

7.5.5 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. The latter should be reported by the other holding. Bees are counted on the basis of number of bee colonies. If other units are used this must be specified in the reports and dissemination products.

7.5.6 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 Theme 9: Work on the holding.

0503 NUMBER OF FEMALE BREEDING ANIMALS (for each livestock species)

Essential item. Reference period: census reference day

7.5.7 Breeding animals refers to the number of female animals that are used for reproduction purposes.

Theme 6: Agricultural practices

7.6.1 Following the criterium of WCA 2020, the section on agricultural practices provides items to better cover some critical elements of sustainability in production systems. It must be taken into consideration that this section 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 section 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*
- *Plant growth regulators*
- *Rodenticides*
- *Other*

Essential item. Reference period: census reference year.

7.6.2 **Pesticides** means any substance, or mixture of substances of chemical, biological or genetic (synthetic) ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth (FAO and WHO, 2014). These can be categorized as shown above.

7.6.3 *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. *Plant growth regulators* are natural or synthetic substances used for controlling or modifying plant growth processes without reducing nutritive value or causing severe phytotoxicity. They are used to modify plant growth such as increasing branching, suppressing shoot growth, increasing return bloom, removing excess fruit, or altering fruit maturity. *Rodenticides* are substances that kill, repel or control rodents.

0604 SELECTED MACHINERY AND EQUIPMENT USED ON THE HOLDING BY SOURCE (for the holding)

Essential item. Reference period: census reference year

7.6.4 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.

7.6.5 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 9, along with a list of some of the major items under each heading.

7.6.6 ***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*

0413 <u>USE OF DIFFERENT TYPES OF FERTILIZING PRODUCTS</u> (for the holding)

Essential item. Reference period: census reference year

7.6.7 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.

0302 <u>AREA OF LAND ACTUALLY IRRIGATED: FULLY CONTROLLED AND PARTIALLY CONTROLLED IRRIGATION</u>

- *Fully controlled irrigation*
- *Partially controlled irrigation*

Essential item. Reference period: census reference year

7.6.8 This item is covered in Theme 3: Irrigation. The area of land actually irrigated complements item 0301 and contributes to understanding the adoption of sustainable agriculture practices.

Theme 7: Services for agriculture

All items of this Theme are additional, please refer to Annex 4.

Theme 8 – Demographic and social characteristics

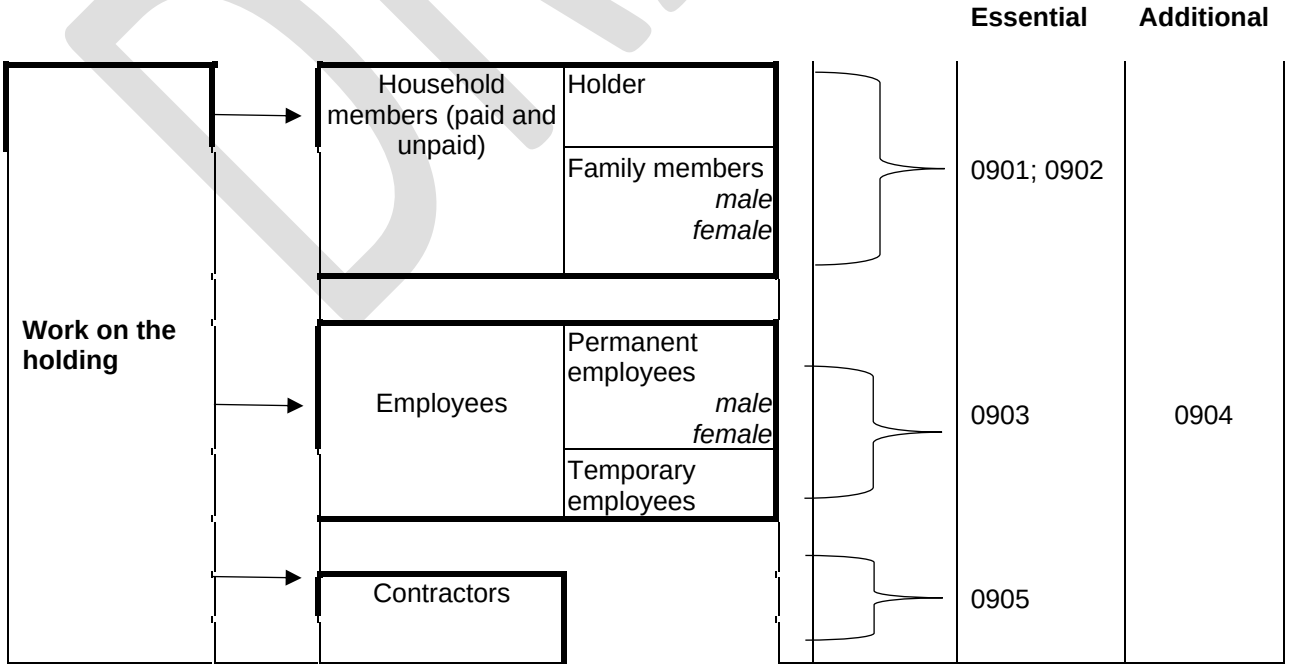
All items of this Theme are additional, please refer to Annex 4.

Theme 9: Work on the holding

Reference concepts of work and forms of work in labour statistics

7.9.1 This theme covers items related to the two types of labour inputs on agricultural holdings: (i) work provided by household or family members, and (ii) work provided by external workers: paid employees and contractors (see Figure 2).

Figure 7.2 - Correspondence between types of labour inputs and work on the holding's items



7.9.2 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 International Conference of Labour Statisticians (ICLS) in 2013 and amended by the 21st ICLS in 2023 (ILO, 2023a) (below referred to as the Resolution). The Resolution establishes a 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. For more detailed information regarding concepts and operational definitions related to forms of work from the ILO resolutions see Annex 10.

7.9.3 Work in the scope of the agricultural census is considered as every type of work on the holding that contributes to either:

- The activities defined in the International Standard Industrial Classification of All Economic Activities (see Annexes 2 and 3) for crop and animal production and related service activities (see also the definition of agricultural holding in paragraph 4.2);
- maintenance of the means of production, or
- activities directly derived from these productive actions.

7.9.4 It does not include domestic and personal services provided for the household's own consumption.

7.9.5 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 under 15 years and those aged 15 years and above. Where countries set the minimum age limit below ten years, tabulations should also distinguish children aged less than ten years.

Census reference year

7.9.6 The labour 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 12 months, 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).

7.9.7 As for other 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.

7.9.8 As noted in Annex 10, 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

7.9.9 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). The main job is determined by either the job

with the longest typically worked hours or, if unavailable, the job generating the highest income for the worker.

0902 WORKING TIME ON THE HOLDING (for each household member of working age, identifying the sex)

Essential item. Reference period: census reference year

7.9.10 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. Countries where paid work of family members in agriculture is quite widespread may wish to collect their working time through item 0903 provided that it is possible to easily distinguish between paid and unpaid forms of work of family members.

7.9.11 To measure the volume of work, the WCA 2030 recommends the same approach as in WCA 2020, using measurement of working time as recommended by 18th 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.

7.9.12 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.

7.9.13 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 job:
  - worked 1-3 months in the year
  - worked 4-6 months in the year
  - worked 7 or more months in the year
- Part-time job:
  - worked 1-3 months in the year
  - worked 4-6 months in the year
  - worked 7 or more months in the year.

7.9.14 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 OF EMPLOYEES ON THE HOLDING: BY WORKING TIME AND SEX (for the holding)

- *Number of employees*
  - *Males*
  - *Females*

Essential item. Reference period: census reference year

7.9.15 Items 0901 and 0902 refer to the work that household members supply to the holding. The current 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.

7.9.16 An employee on the holding is a person who had a job on the holding at some time during the reference year, whose status in employment for that job was "employee" (see Annex 10). 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 Annex 4, theme 1, paragraph 12) remunerated in the form of wages or in-kind payments is considered part of the employees on the holding.

7.9.17 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 0905. For more information on the difference between employees and contractors, see Annex 10.

7.9.18 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.

7.9.19 Working time data for employees should be consistent with the similar data for household members (see Annex 10). In this regard, the working time groupings/categories considered in paragraph 7.9.13 should be suitable. Employees can be grouped according to the short or long duration of their implicit or explicit contracts (e.g. regular employees, seasonal, short-term, and casual workers).

7.9.20 As for all working time data, care is needed in designing suitable questionnaires and data collection procedures, suitable to national circumstances.

0905 USE OF CONTRACTORS FOR WORK ON THE HOLDING ACCORDING TO TYPE OF SERVICE (for the holding)

Essential item. Reference period: census reference year

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

7.9.22 Dependent contractors are defined as workers who have contractual arrangements of a commercial nature (but not a contract of employment) to provide goods or services for or through another

economic unit. The type of services provided include crop protection, tree pruning, crop harvesting, sheep shearing or farm administration. Dependent contractors satisfy the following conditions:

- they are not employees of that economic unit, but are dependent on that unit for organization and execution of the work, income, or for access to the market;
- they are workers employed for profit, who are dependent on another entity that exercises control over their productive activities and directly benefits from the work performed by them;
- the activity of the dependent contractor would potentially be at risk in the event of termination of the contractual relationship with that economic unit.

7.9.23 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-18 (ILO, 2023b), dependent contractors as workers employed for profit are usually responsible for arranging their own social insurance and other social contributions, and the entity on which the workers are dependent does not withhold income tax for them.

7.9.24 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: Aquaculture

7.10.1 The content of this theme is in line with the FAO land use classification and SEEA Land Use Classification (refer to paragraphs 7.2.10 –7.2.11). The current theme outlines the fundamental items recommended 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, 2015b).

1001 PRESENCE OF AQUACULTURE ON THE HOLDING

Essential item. Reference period: census reference year

7.10.2 In the context 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. This item could be used to establish sampling frames for aquaculture-related census supplementary modules and ongoing surveys on aquaculture. 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 3.

7.10.3 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. 5). 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, brackish water or saltwater.

7.10.4 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 (i.e. seaweed and other algae) 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.

7.10.5 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 aquaculture. Limited enhancement

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

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

Theme 11: Forestry

All items of this Theme are additional, please refer to Annex 4.

Theme 12: Fisheries

All items of this Theme are additional, please refer to Annex 4.

CHAPTER 8

COMMUNITY-LEVEL DATA

The collection of community-level data was first introduced in the programme for the WCA 2010 round. The current programme keeps it. 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

8.1 The main focus of an agricultural census is 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.

8.2 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.

8.3 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, was therefore retained in the previous programme and maintained in the current round. Countries are encouraged to include this component according to national circumstances and data requirements. Community-level data are of statistical interest for several reasons.

8.4 First, the data are of interest for analysing the characteristics of communities. For example, information on communities with or without an agricultural input supplier in the community can be useful to understand 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.

8.5 Second, the data can be useful for analysis in relation to holding-level data. For example, one could tabulate the number of holdings growing 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.

8.6 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 can provide a complete picture of land used for agricultural purposes at the national and subnational levels.

8.7 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. At times, supervisors or regional coordinators are in charge of the collection of the community-level data.

Methodological considerations

Defining a community as a statistical unit for community-level data collection

8.8 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 or contiguous sets of living quarters and that has a name or a locally recognized status" (UN, 2025d, paragraphs 5.93 – 5.96). Under these definitions, the community or locality may not be the same as the lowest administrative unit.

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

- Data collected. Often, the data requires 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. Easy access to such information is needed to do a community survey.
- Stability of community units. In many countries, changes in administrative units are common and not well-coordinated, making it difficult to carry out a community survey.

8.10 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 must 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.

8.11 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

8.12 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 Enumeration Areas (EAs) (see paragraphs 5.28 - 3.29). Often, the community units identified for the community survey are subdivided to form suitably sized EA units. In such cases, the most experienced supervisors or enumerators in charge of data collection in the community could be assigned in advance to administer the community questionnaire.

8.13 Where the community administration prepares the list of households or holdings for the agricultural census, it may be possible to ask the community chief or other 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.

8.14 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.

8.15 The questionnaire may be filled through an interview with the head of the village by an enumerator or using the technique of an expert group for each community. The expert group is usually composed of the chief of the village with the participation of prominent citizens and resource persons with good knowledge of the village's social, economic and environmental situation (teachers, nurses, extension officers, religious leaders, nongovernmental organization agents, leaders of farmers' organizations, etc.). Consideration could 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. Likewise, another possibility is to collect data using CAWI method, providing a link to the online questionnaire to be filled out by community officials.

Community-level items

8.16 Many types of data are of possible interest for the community survey. The content of the community survey should be determined by considering 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 survey and therefore only some general guidelines are provided in this section.

8.17 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 to existing community registers or databases and avoid duplicate collection of data already available. The agricultural census could then focus on just the agriculture-related data.

8.18 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 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 9.30 -9.32.

- 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.

8.19 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, databases, or population and housing censuses, 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 on communal lands
2306 Area equipped for irrigation on communal lands
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 selected community-level items

8.20 Location (Item 2101) is normally based on a geographic coding system (see paragraphs 7.1.2 - 7.1.4). This item is needed to summarize the data by geographical groupings, to relate the data to holding-level data, and to link community databases.

8.21 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.

8.22 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 7.2.8 - 7.2.37). Land use data at the community level may be shown in more detail, such as showing land under water or identifying different forest types.

8.23 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.

8.24 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 7, Theme 2 should be applied (see paragraph 7.2.14).

8.25 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, or during summer and severe winter conditions. 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.

8.26 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.

8.27 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.

8.28 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".

8.29 Main economic activities (Item 2204) should be based on the ISIC Rev. 5 (UN, 2025a).

8.30 Whether there are seasonal food shortages (Item 2205). This item is suitable for countries where seasonal factors affect food supplies. The reference period could be the census reference year.

8.31 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, and the seasonal component should be considered, if applicable.

8.32 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 9

TABULATION

To be useful, data collected in an agricultural census must be presented in aggregated and synthetized form, especially in statistical tables. This chapter 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, aquaculture, and forestry. The tabulation plan serves as a roadmap for organizing the data collected from an agricultural census and conducting the analysis in a structured and consistent manner.

Introduction

9.1 Following the census data collection, countries should embark in data processing, including tabulation, These operational topics are discussed in detail in Chapter 21 of the Operational Guidelines (FAO, 2018a).

9.2 Data collected in an agricultural census are of statistical interest if they can be aggregated and analysed to provide valuable insights and information about the agricultural sector. The primary form of presentation for statistical data is the statistical table. Statistical tables provide a structured and organized presentation of data, allowing for easy comparison, analysis, and interpretation of the census results. The tabulation program for an agricultural census refers to the set of statistical tables that are specifically prepared to present the main findings and key results of the census. These tables should be designed based on the primary needs and requirements of the intended users of the census data.

9.3 However, with the rapid advancement of information and communication technologies, the presentation of census data is undergoing significant changes. Traditional printed reports have become less relevant as new tools and platforms are more often used. The compilation and dissemination of census data have become more user-friendly, thanks to technological advancements. This increased interactivity and flexibility empower users to explore the census data in ways that suit their specific requirements and research interests. However, three important considerations remain:

a) The existence of a tabulation program: during questionnaire design it is necessary to determine the generic tabulation programme for the agricultural census. This ensures that the data collected align with the requirements of the tabulation programme[15]. Furthermore, the choice of a tabulation programme can influence the overall census design. For instance, the level of administrative units included in the tabulation programme may impact decisions related to the census enumeration method, and the determination of sample size if the modular approach is adopted for the census.

b) Production of basic standard reports: while web-based data have made it easier for users to access and analyse census data, it is still important for countries to produce basic standard reports. These reports serve as a fundamental source of information and are disseminated through various media channels such as print, pen drives, or the internet. The purpose of producing standard reports is to ensure that the census results reach a wide audience, including those who may not have access to or prefer web-based platforms.

c) Standard tables for international comparisons: to facilitate international comparisons and promote harmonization of census data across countries, the use of standard tables is essential. Even for countries that do not have their census databases on the web, it is important to provide standard tables that contain comparable data. By adhering to standard tables, countries can ensure consistency and compatibility in their census data, enabling meaningful

[15] In other words, the questions asked in the census should be designed in a way that allows for effective data analysis and aggregation according to the desired tabulation programme.

cross-country analyses and benchmarking exercises.

9.4 In a standard report of an agricultural census, statistical tables are commonly used to present summarized measures of the collected data. These may include:

- Totals for items collected: These are aggregate figures that represent the sum of all the individual data points for a specific item or variable. For example, the total area of sugar cane harvested across all farms or agricultural holdings included in the census.
- Total number of units with certain characteristics: This refers to the count of units or entities that possess specific characteristics of interest. For example, it could be the total number of farms or agricultural holdings that have pigs.
- Averages for items: Averages provide a measure of central tendency. In the case of an agricultural census, this could be the average area of a holding or farm, calculated by dividing the total area of all holdings by the number of holdings.
- Percentages: Percentages could be used to indicate the proportions, such as proportion of holdings using organic fertilizers or the percentage of communities with electricity connected.

9.5 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. A holding may manage lands placed in different administrative units and even different agro-ecological zones. If this is significant in a country, tabulation of agricultural holdings by administrative unit or agro-ecological zone could lead to misleading results. In such cases, the location of parcels (additional item 0205) could be used as main classification variable in relevant cross-tabulations.

9.6 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.

9.7 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- <2 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.

9.8 An important element in preparing the agricultural census tabulation programme is deciding on the tabulation classes. In many instances, international standards exist, and countries should strive to adhere to these standards whenever possible to facilitate cross-country comparisons. It is also essential to ensure consistency within a country's statistical collections. For instance, using age groups like 25-34 and 35-44 in one data collection and 20-30 and 31-40 in another would hinder meaningful data comparison. This chapter provides recommended classes for use in agricultural census tabulation programs. However, it is encouraged that countries introduce more detailed classes to accommodate national reporting requirements that do not align with the listed tabulation classes. This flexibility allows for later re-aggregation to international standards for the purpose of comparison. In cases where countries employ unique units of measure, additional tabulations using both international units of measure and the tabulation classes specified in Table 9.1 become necessary to enable international

comparisons. If a country opts for different class groupings in its standard reports, it should also report results according to the provided guidelines to ensure international comparability. Another important element in a table is its title, which have to provide basic and clear information about the table contents.

Essential items to be tabulated in standard reports

9.9 Essential items refer to the data items or variables that are considered crucial and necessary for every country to collect during an agricultural census. These items are important for both national and international purposes. Examples of essential items could include information on land area, livestock populations, and other key aspects of agriculture (See Chapters 6 and 7). Essential items are further classified or broken down into groups, which are referred to as tabulation classes. In some cases, a specific component or attribute of an essential item is used to establish the tabulation classes. This component is known as a classification variable. It helps define the different groups within the essential item and aids in organizing the data for analysis and reporting purposes. For example, when classifying holdings according to land size, a classification variable could be land size classes. Table 9.1 summarizes the tabulation classes and reference groups for each essential item or variable. The tabulation classes represent the different categories or groups into which the data is classified based on size, type, or other relevant factors. The reference group refers to the specific set of holdings or units for which the item will be tabulated. For example, the item "area irrigated" is only meaningful when tabulated for land holdings, as it pertains to the area of land that receives irrigation. There can be more than one way to tabulate certain items. Holdings can be tabulated based on whether they have each livestock species or by the number of a particular species of livestock they have.

9.10 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. These variables serve the purpose of categorizing or grouping the census data for tabulation, especially when dealing with essential concepts such as the number of holdings. These classification variables enable the exploration of connections between agricultural holdings and the characteristics of the community, facilitating a deeper understanding of these relationships. This is discussed in paragraphs 9.35.

9.11 In certain countries, economic typologies play an important role in agricultural censuses. These typologies are classifications or categories that help identify and understand different aspects of agricultural activities within a country. Examples of such typologies include determining the main agricultural activity conducted on a farm or typologies of farms. It is important to note that these typologies are not explicitly defined as part of the WCA. However, the essential items of the census serve as a significant source of information for developing these typologies.

Table 9.1 - 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 agricultural 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 (one holder) 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	Holdings in household sector

	25 – 34 years 35 – 44 years 45 – 54 years 55 – 64 years 65 years and over Joint holders	
Household size (from 0106 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
0107 Educational attainment of holder, spouse, and manager	Less than primary Primary Secondary Post-secondary	Holdings in household sector
0110 Main purpose of production of the holding	Producing mainly for home consumption Producing mainly for sale	Holdings in household sector
0111 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 – < 2 ha 2 – < 5 ha 5 – < 10 ha 10 – < 20 ha 20 – < 50 ha 50 – < 100 ha 100 – < 200 ha 200 – < 500 ha 500 – < 1000 ha 1 000 – < 2 500 ha 2 500 ha and over	All holdings
Land use types (from 0203 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 0203 Area of holding according to land use	Holdings without agricultural land Holdings with agricultural land	All holdings

types)	(Area groupings as for “area of holding”)	
Land tenure types (from 0204 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
Area of temporary crops planted (from 0402 (for each temporary crop type))	Holdings without temporary crops Holdings with temporary crop area planted (Area groupings as for “area of holding”)	All holdings
Area of temporary crops harvested (from 0403 (for each temporary crop type))	Holdings without temporary crops Holdings with temporary crop area harvested (Area groupings as for “area of holding”)	All holdings
Area of permanent crops (from 0408 Area of productive and non-productive permanent crops in compact plantations)	Holdings without permanent crops in compact plantations Holdings area under permanent crops in compact plantations Based on crop classification in Annex 6 Also classified by: Area grouping of compact plantations	All holdings
Presence of scattered permanent crop trees (from 0409 Number of permanent crop trees in scattered plantings)	Based on crop classification in Annex 6	All holdings
0413 Use of different types of fertilizing products	No use of fertilizing products Use of fertilizing products ♦ 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 production system	Holdings without livestock Holdings with livestock ♦ Integrated crop-livestock production systems/mixed systems ♦ Specialized livestock production systems ◊ *Landless livestock*	All holdings

	production systems ◊ *Grassland-based livestock production systems/grazing system*	
Livestock species (from 0502 Number of animals)	Holdings without livestock Holdings with livestock Based on livestock classification in Annex 8	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
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 species (0502af))	All holdings
0601 Use of agricultural pesticides	No use of agricultural pesticides Use of pesticides: Insecticides Herbicides Fungicides Plant growth regulators Rodenticides Other	All holdings (One holding can belong to more than one class)

0604 Selected machinery and equipment used on the holding by source	Total tractors of all kinds Four-wheel tractors Track-laying tractors Combine harvesters Ploughs (machine powered) Other machine-powered (to be specified)	All holdings
Number of household members for whom working on the holding is the main activity (from 0901 Whether working on the holding is the main activity)	Male ♦ 1 person ♦ 2 – 3 persons ♦ 4 – 5 persons ♦ 6 – 9 persons ♦ 10 persons and over Female groups as above	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 of employees on the holding by working time and 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
0905 Use of contractors for work on the holding according to type of service	No use of contractors Use of contractors ♦ Crop protection ♦ Tree pruning ♦ Crop harvesting ♦ Sheep shearing ♦ Farm administration ♦ Other	All holdings
1001 Presence of aquaculture on the holding	Aquaculture is present Aquaculture is not present	All holdings

Main classification variables

9.12 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 9.1 refers to the essential items. However, countries are free to present finer classifications within the limits of classes present here.

9.13 **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.

9.14 **Legal status of agricultural holder** (type of holder) (Item 0103). This item captures information about the legal structure of the entity that operates the agricultural holdings. It provides essential data for conducting comparative analysis among different types of agricultural holders regarding their legal status, such as household, cooperatives, corporations, educational institutions, and other legal entities.

9.15 **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. Additionally, the measure does not take into account the quality of the land. For instance, non-irrigated land in arid or semi-arid regions may be less productive compared to irrigated land elsewhere. Similarly, land at higher altitudes may have different productive capacities compared to the same land area at lower altitudes. Furthermore, the measure of the area of holding overlooks the intensity of land use. Some land parcels may be able to produce multiple crops per year, while others may only yield a crop every two or three years. This variation in land use intensity is not captured by the area measurement alone. To ensure international comparison, countries should convert all areas to hectares if a different unit of measurement is used. This standardization facilitates meaningful tabulation and analysis across different countries and regions.

9.16 **Area of agricultural land** (from Item 0203). This measure specifically accounts for the land used predominantly for crop production and grazing. Other land measures, such as area of permanent crops, may also be useful classification variables. The use of consistent units, such as hectares, when reporting the area of agricultural land is pertinent here.

9.17 **Number of livestock (for a particular livestock species)** (Items 0502a–0502f). The number of livestock of a particular species 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 instance, in a country known for its sheep-raising industry, it can be valuable to categorize agricultural census data based on different classes defined by the number of sheep. These classes can be ranges such as 1-4 head, 5-9 head, and so on. Normally, it is only possible to classify agricultural census data based on a particular species of livestock, rather than for all livestock or groupings of livestock species, as it is difficult to meaningfully group livestock of different species. Sometimes, groupings such as “large animals”, “small animals” and “poultry” can be used to describe cattle/buffaloes, sheep/goats/pigs, and chickens/ducks, respectively.

9.18 **Main purpose of production of the holding** (Item 0110). Purpose of production serves as a valuable indicator for analysing holdings based on their market orientation. In agricultural census data, the purpose of production refers to the primary objective or goal for which a holding engages in agricultural activities. The purpose of production provides insights into whether a holding is primarily focused on producing goods for the market, such as crops, livestock, or other agricultural products intended for sale.

9.19 **Household size by sex and age groups** (Item 0106). Household size is considered a valuable classification variable as it provides insights into the relationship between rural populations and land dependence, as well as the availability of labour within households for agricultural activities. To further

analyse and present data on household size, some countries may choose to utilize equivalence scales. These scales consider the demographic characteristics of households, such as the number of adults and children, to provide a more accurate assessment of the household's economic resources and needs. For more information, see Handbook on Household Income Statistics (UNECE, 2011).

9.20 **Sex of agricultural holder** (Item 0104). The sex of the agricultural holder is a valuable measure for analysing the involvement and role of women in agriculture. However, tabulating the sex of the holder can be complex due to situations where multiple individuals are considered as holders.

In case of multiple holders for the same holding, determining the sex of the holder requires careful consideration. Various approaches can be used to address this complexity:

- Primary Holder: One approach is to identify a primary holder within the holding. The primary holder can be determined based on factors such as decision-making authority, management responsibilities, or the individual primarily engaged in agricultural activities. In this case, the sex of the primary holder can be recorded.
- Joint Holding: If the agricultural holding is jointly managed by multiple holders, it may be necessary to record the sex of each person involved. This can be done by collecting information on the sex of each holder and indicating the specific roles and responsibilities of each individual within the holding.
- Aggregated Data: In some cases, it may not be possible or practical to record the sex of each individual holder within a complex holding. In such situations, aggregated data can be used. This involves reporting the total number of male and female holders within the holding, without specifying the sex of each individual.

It is important to note that the specific approach to tabulating the sex of agricultural holders may vary depending on the context, cultural norms, and data collection methodologies employed in a particular country or region.

9.21 **Age of agricultural holder** (Item 0105). This classification variable is intended for the purpose of comparing the age demographics of farmers (e.g., categorising the population of farmers into age groups and investigating the impacts of rural-to-urban migration). It specifically focuses on a subset of agricultural holdings led by a single individual, where the age of the holder holds particular significance for analysing and making informed decisions within the realm of agriculture and rural development.

Table 9.2 - Agricultural census essential items: recommended cross-tabulations

ESSENTIAL ITEM*	MAIN CLASSIFICATION VARIABLE								
	Administrative unit agro-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					..	N		-
Household size (from 0106 Household size by sex and age groups)	N,A,L		N,A	N,A	N,L	N	-		
0107 Educational attainment of holder, spouse, and manager	N		N						
0108 Agricultural training/education of the holder	N		N					N	N
0110 Main purpose of production of the holding	N,A,L	N				-	N		

0111 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
0203 Area of holding according to land use type	N,A	N,A	N,A	-		N,A	N,A		
0204 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 planted	N,A	N,A	N,A	N,A		N,A	N,A		
0403 Type of temporary crops harvested	N,A	N,A	N,A	N,A		N,A	N,		
0408 Area of productive and nonproductive permanent crops in compact plantations	N,A	N,A	N,A	N,A		N,A	N,A		
Presence of scattered permanent crop trees (from 0409 Number of permanent crop trees in scattered planting)	N	N	N	N			N		
0413 Use of different types of fertilizing products	N	N			N	N	N		
0501 Type of livestock production system	N,L	N,				N,L	N,L		
0502 Number of animals	N,L	N,L				N,L	N,L		
0503 Number of female breeding animals	N,	N,A	N,A	N,A		N,A			
0601 Use of agricultural pesticides	N		N,A		N,L				
0604 Selected machinery and equipment used on the holding by source	N	N	N	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		
1001 Presence of aquaculture	N		N						

N = Number of holdings; A = Area; L = Number of livestock. *Please refer to Table 9.1 for the tabulation classes of the essential items.

Working time on the holding

9.22 Data on working time at the holding level (Items 0902 and 0903) provide valuable insights into the amount of work required for different types of holdings, such as livestock holdings or those with temporary crops. However, the tabulation classes in Table 9.1 only allow for tabulating the number of workers based on categories of working time. To report on the total labour input to holdings, it is necessary to aggregate the total working time contributed by all workers on the holding. This requires converting the categorical data on working time for household members and employees into continuous or ratio data. By doing so, the aggregate working time can be calculated. There are various methods available for converting categorical data into continuous data. Once the quantity of working time for household members and employees has been determined, it can be aggregated to obtain the total quantity of working time on the holding. Some countries even establish special units of working time, representing the work performed by one person occupied on an agricultural holding on a full-time basis. An increasing practice is the employment of third-party workers who can be contracted either from other farms or from specialized enterprises (see paragraphs 7.9.17 and 7.9.21 to 7.9.24). The time worked by this type of workers should also be included in the total labour input for holdings.

9.23 However, the specific units to be used for measuring working time are determined by each country according to their specific needs and requirements. The tabulation of the data would involve reporting the amount of aggregate working time or the number of special units of time based on various characteristics, such as the sex of workers, legal status of holdings, and size of holdings.

Essential items: cross-tabulations

9.24 In an agricultural census, there are numerous possibilities for generating tables based on different combinations of variables. Even with a limited number of items, the potential for cross-tabulations is vast. Each essential item collected in the census can be analysed in relation to various main classification variables. For example, the item "presence of aquaculture" can be cross-tabulated against the administrative units to examine the geographical distribution of aquaculture. This analysis would provide insights into the regions or districts where aquaculture is more prevalent or concentrated. Similarly, aquaculture can be cross-tabulated against the area of holding to explore the relationship between aquaculture and the size of agricultural holdings. This analysis could help identify patterns or correlations between aquaculture activities and the scale of farming operations. Furthermore, these cross-tabulations can be combined to gain a more comprehensive understanding. For instance, aquaculture can be cross-tabulated simultaneously by administrative unit and area of holding. This would allow for a deeper analysis of how aquaculture and the size of holdings vary across different parts of the country. It could reveal if certain regions have a higher concentration of aquaculture in specific sizes of agricultural holdings. 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.

9.25 Generating a statistical table from an agricultural census requires expertise in data analysis and tabulation techniques. Countries need to develop a practical census tabulation program that considers available resources and the significance of the information to be included in the final report. It is important to strike a balance between the level of detail in the tabulations and the resources required for their production. For instance, it might be essential to include a table that presents the distribution of land area by the age of the holders. However, tabulating the type of permanent crops by the age of the holders might not be as crucial and could add unnecessary complexity to the data analysis process. Countries should exercise caution when classifying data into fine categories for cross-tabulations. This is because smaller subgroups may result in table cells being based on only a few holdings. Such limited sample sizes can compromise data confidentiality, as it becomes easier to identify individual farms or holders from the published information. This concern becomes even more significant when presenting census data on the web. Without appropriate precautions and data anonymization techniques, there is a risk that users accessing the online data may be able to extract individual-level information. This can raise privacy and confidentiality issues, which need to be addressed to ensure the responsible use and dissemination of agricultural census data.

9.26 The most common cross-tabulations for the essential items are summarized in Table 9.2. The rows of Table 9.2 show the essential items to be tabulated in a standard report. The columns show the nine main classification variables given in paragraphs 9.13–9.21. Classification variables appear in both the rows and columns. The body of Table 9.2 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 9.2 as they need to be converted from categorical to continuous data (see paragraph 9.22). 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).

9.27 The following example illustrates the use of Table 9.2. 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 Table 9.1; and the other showing the total area of holdings for each area of holding and household size class.

9.28 In the context of tabulating the "number of holdings," the cells in the table may or may not be mutually exclusive (refer to the “Reference group” in the last column of Table 9.1), for example:

- Mutually exclusive classes: One case is when the number of holdings is classified by land size. In this scenario, each holding is assigned to a particular land size class category, meaning it can only belong to one class.
- Non-mutually exclusive classes: In other cases, the classes or categories may not be mutually exclusive, which means that a given holding can be included in multiple categories simultaneously. One example is when the number of holdings is classified by land use. Here, a holding may have multiple land use types (e.g. it may have land allocated for permanent crops, forest, and other land uses simultaneously), and it would be counted in each relevant category. In the case of non-mutually exclusive classes, the total of holdings is not relevant.

9.29 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. In addition to the main census report, countries may choose to prepare supplementary thematic reports that delve into specific areas of interest. For example, a thematic report might focus on the gender dimension of agriculture, analysing data related to female holders, their access to resources, and their contribution to agricultural production. Another thematic report could analyse crops or livestock. With advancements in technology, countries could disseminate additional cross-tabulations and detailed data through web-based platforms. These online resources can provide interactive visualizations, allowing users to explore specific cross-tabulations of interest, such as comparing livestock populations across agro-ecological zones The tabulation programme in Table 9.2 will not necessarily meet all data needs even for the essential items. Countries should prepare additional tables as needed.

Community-level data

9.30 Community-level data in an agricultural census refers to information collected at the community level, which can be utilized in two main ways. Firstly, it can be summarized to provide an overview of the characteristics and attributes of communities themselves. This includes demographic information, socio-economic indicators, infrastructure availability, and other relevant community-level data. Secondly, community-level data can be used as classification variables to categorize and analyse census holding-level data. This involves linking each individual agricultural holding to its corresponding community. However, establishing this link can be challenging in many countries. Different communities may be referred to by various names, or the boundaries of communities may be ambiguous or undefined. Therefore, it is essential to conduct preliminary cartographic work to clearly determine the community or communities to which each enumeration area (EA) in the census belongs.

9.31 The cross-tabulation of community-level and holding-level data is also very important for assessing the quality and reliability of the information collected during the census. By comparing data at these two levels, inconsistencies or discrepancies can be identified and investigated further. For instance, if a census questionnaire indicates that a holder is a member of a farmers' association, but there is no record of such an association within the community, it raises the need for clarification. Similarly, if a holder is reported to have animals grazing in communal land, but there is no communal grazing land documented in the community, clarification becomes necessary.

9.32 In certain situations, community-level data needs to be organized into appropriate groupings for effective tabulation and presentation in a standardized report. This is particularly relevant for data concerning traveling time, where it is important to create meaningful categories that reflect the accessibility of a specific service for people in the community. For instance, the traveling time data collected from different communities can be grouped into categories such as ‘’less than 1 hour’’, “1–2 hours”, and ‘’more than 2 hours”. These groupings would provide a clear understanding of the distribution of commuting times and the level of convenience or difficulty people face in accessing a service.

Summary characteristics of communities

9.33 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 can also extend beyond community-level characteristics to include holdings or the population. For instance, tabulating the number of agricultural holdings or the percentage of the population engaged in specific community characteristics, such as access to extension services.

9.34 The classification variables used for tabulations can vary depending on the data collected. Administrative divisions, such as provinces or districts, are commonly used for categorizing communities. Additionally, agro-ecological zones, which consider ecological factors like climate, soil type, and vegetation, may be employed to classify communities with specific agricultural characteristics.

Community-level data as classification variables for holding-level data

9.35 When tabulating holding-level data using community-level classification variables, the choice will vary based on the specific content of the community survey. The primary holding-level data commonly used in these tabulations include the number and area of holdings, and the population associated with those holdings.

Typical community-level classification variables are:

- **Access to urban centre**. This item is useful for analysing agricultural practices of individuals residing in isolated areas. One way to measure access is by considering the traveling time from a community to the nearest urban centre[16]. Another aspect of access is whether the community is connected to the urban centre by a year-round motorable road[17].
- **Risk of natural disasters**. This item serves to assess how farmers modify their agricultural methods in response to natural disasters. In some cases, the classification specifies the nature of the 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 variable examines whether a community has a periodic or permanent agricultural produce market or the proximity of the community to the nearest market. It provides valuable information for analysing crop and livestock activities in relation to market availability. For example, a community with a permanent market nearby may have more opportunities for farmers to sell their produce, leading to different agricultural practices compared to a community that relies on periodic or distant markets. This variable helps assess the market access and potential economic benefits for agricultural holdings in different communities.
- **Access to veterinary services**. This item focuses on the availability of veterinary services in a community, or the travel time required to reach the nearest veterinary services. It serves as a useful classification variable for analysing livestock-related data, such as livestock deaths. For example, a community with easy access to veterinary services may experience lower livestock mortality rates due to timely disease prevention and treatment. Understanding this relationship enables targeted interventions to improve animal health.
- **Access to farm input trading centre**. This item examines whether an input trading centre is available in the community or the travel time to reach the nearest input supplier. It provides insights into the accessibility of farm inputs, such as seeds, fertilizers, and machinery. This

[16] For example, if a community has a short travel time to reach the nearest urban centre, it suggests relatively easier access to resources, markets, and services available in urban areas. On the other hand, if the travel time is significantly longer, it indicates a more remote and isolated location, which may have implications for agricultural practices due to limited access to external inputs, markets, and infrastructure.

[17] This criterion focuses on the presence of a reliable road infrastructure that allows regular transportation between the community and the urban centre throughout the year. A year-round motorable road ensures smoother movement of goods, services, and people, enabling farmers in isolated areas to access markets, agricultural inputs, and other essential resources more conveniently. In contrast, if a community lacks a year-round motorable road, it may face challenges in transportation, leading to difficulties in agricultural activities and limited integration with the broader agricultural economy.

classification variable can be used to examine the constraints to improving agricultural productivity because of difficulties in accessing farm inputs.

- **Access to credit institutions**. This classification variable helps to assess the presence of rural banks or credit institutions in the community or the travel time to the nearest rural financial institution. It serves as a classification variable to analyse credit data and evaluate the ease of accessing credit facilities for agricultural purposes. For example, communities with limited access to credit institutions may face difficulties in obtaining financial resources for farming activities.
- **Access to farmers' association**. This item examines the existence of farmers' associations in the community. It can also identify different types of associations if applicable. Analysing this variable helps study the benefits that farmers derive from such associations. Farmers' associations often provide platforms for knowledge sharing, collective bargaining, and accessing resources. For example, a community with active farmers' associations may experience enhanced market opportunities, improved agricultural practices, and stronger social networks among farmers.
- **Presence of specific development projects**. This can be a useful classification variable for examining how such projects have benefited farmers. Development projects can include initiatives focused on infrastructure development, technology adoption, irrigation systems, or value-chain interventions.

Other tabulations

Aquaculture

9.36 As with the census of agriculture, each item related to aquaculture should first be tabulated by administrative unit or agro-ecological zone.

9.37 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 9.13).
- **Legal status of holder** (Reference group: all aquacultural holdings): as for agricultural holding tables (see paragraph 9.14).
- **Total area of holding** (Reference group: all aquacultural holdings): as for agricultural holding tables (see paragraph 9.15).
- **Area of aquaculture** (Reference group: all aquacultural holdings). This is based on Item 1002 (see Annex 4, theme 10). The area groupings should be the same as for area of holding (see Table 9.1). This is useful as a measure of size of the aquacultural activities.
- **Household size by sex and age groups** (Reference group: all aquacultural holdings in sector "holdings in household sector" in Item 0103): as for agricultural holding tables (see paragraph 9.19).
- **Sex of holder** (Reference group: all aquacultural holdings in sector "holdings in household sector" in Item 0103): as for agricultural holding tables (see paragraph 9.20).
- **Age of holder** (Reference group: all aquacultural holdings in sector "holdings in household sector" in Item 0103): as for agricultural holding tables (see paragraph 9.21).

9.38 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.

CHAPTER 10

DATA DISSEMINATION, DATA CONFLICTS AND ARCHIVING

This chapter emphasizes the significance of data access as a key element within the agricultural census program, particularly highlighting dissemination, conflicts, archiving, and safe accessibility of census metadata, aggregated data, and microdata. Additionally, it explores the advantages associated with archiving census data.

Introduction

10.1 Following data processing, census data needs to be analysed and published. Chapter 24 of the Operational Guidelines (FAO, 2018a) discuss census dissemination strategies and analytical products.

10.2 The agricultural census aims to offer valuable insights for stakeholders to plan, evaluate, and monitor policies. On the other hand, the data collected holds immense importance for various sectors including private enterprises, research entities, and industries. 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 one of the main purposes 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 Cape Town Global Action Plan for Sustainable Development Data 2017 (UNSC, 2017) has as its objective, in the Strategic Area 4, the dissemination and use of sustainable development data, through seven key actions. In 2018, the United Nations Statistical Commission created a subgroup on open data under the Friends of the Chair group on the Fundamental Principles of Official Statistics (FOC-FPOS) to work on principles, guidance and support for the implementation of open data in countries. Successful dissemination and archiving require that appropriate metadata is included for both macro and microdata.

10.3 Metadata provides information about one or more aspects of the data. Metadata help users to understand what the data are measuring and how they have been collected. This information helps prevent the users from misunderstanding the data and helps 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.

10.4 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) or the Dublin Core Metadata Initiative (DCMI), are also used. Chapter 22 and Annex 4 of the Operational Guidelines (FAO, 2018a) further discuss census metadata.

10.5 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

10.6 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 each particular type of user. For example, policy users in government may require that the results be analysed and include focused basic summaries of key changes and problem areas relevant to the agricultural policy of interest, with accompanying graphics, maps, 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 as possible. The researchers would then conduct the analysis as needed. The products should include both products for public use and specific products for internal agency use.

10.7 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. Other reports include a non-household holdings report; a rural community report; and various thematic reports, including gender report. In addition, as part of the advocacy, a brochure presenting the key findings can be produced, or X posts (previously tweets) and videos promoting the publication of the different reports. The dissemination plan should also include a technical reference report containing metadata, methodological and operative actions, the census questionnaires, the main census manuals, and quality assessments, such as response rate, census coverage, proportion of imputed data by variable, etc. Consideration should be given to developing a regionally standardized reporting format to allow for easier comparison and knowledge-sharing among countries in the region.

10.8 A variety of media can be used for dissemination, including print, online and social media, although online dissemination is currently the preferred method by almost all countries due to simplicity and cost. In order to better meet the data needs of users, electronic form allows 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. Chapter 24 of the Operational Guidelines (FAO, 2018a) discuss census dissemination products.

10.9 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. A wider range of modalities for dissemination 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. The use of electronic formats encourages greater opportunities for use of the data and further analysis by users and is therefore encouraged wherever possible.

10.10 Value added products can also be provided, such as census maps, preferably in 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. Chapter 24 of the Operational Guidelines (FAO, 2018a) discuss census geographic products.

10.11 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. It is advisable to conduct the majority of these activities via online platforms to widen participation, particularly enabling those far from the event locations

to engage. It is also useful that these videos are available on the census website so that they are accessible asynchronously by different users.

10.12 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.

10.13 By disseminating standard tables in line with the recommendations outlined in Chapter 9, countries can ensure consistency and compatibility in their census data, enabling meaningful cross-country analyses and benchmarking exercises. At the end of each decennial census round FAO reviews national census data the national census results and publishes international comparison tables under the Statistical Development Series (SDS). Since 2022, the FAOSTAT domain disseminates structural data from agricultural censuses in a standard format.[18]

Safe access to census microdata

10.14 Microdata from national censuses represent a valuable public good that should be widely promoted by national census offices to enhance its use by the various users and justify the high cost of the census. 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.

10.15 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, researchers might tend to try to collect their own data via studies and surveys.

10.16 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. In this sense, it is necessary to reduce the risk of disclosure without losing information and increasing the usefulness of the data. 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.

10.17 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, 2014).

10.18 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.

10.19 Common types of methods for safe access are:

- Public Use Files (PUFs): These files (which may be from a sample of census records) undergo a rigorous statistical disclosure control (SDC) process so that the chance of re-identification of respondents is minimal.

[18]FAOSTAT domain on Structural data from agricultural censuses is available at: https://www.fao.org/faostat/en/#data/WCAD

- Licensed Files: Licensed files are also anonymized but with the possibility of fewer Statistical Disclosure Control 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 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.

Promoting statistics through contemporary media and tools

10.20 Ensuring broader accessibility of agricultural census results to non-experts is crucial. While reports and microdata often target experts, policymakers, and researchers, the general public requires alternative avenues to engage with these statistics.

10.21 Social media comprise a group of internet-based applications based on contents created by their users, where the information goes viral quickly based on recommendations and actions of other users. Over time, different platforms and applications have become more or less popular. The vertiginous changes occurring in this area make impossible to recommend a particular media and each country will decide which media is the most appropriate to that end.

10.22 Social media should be used to popularise the key results of agricultural census and surveys, through different publications and videos. In the same way, the available reports of final results can be publicized through different platforms. Some of the outreach activities mentioned in 10.10 and 10.11 may be broadcasted live to reach a more interested audience and should remain available on official websites to be accessible at any time.

10.23 It is important to note that social media should be used throughout the census operation. In the pre-census period, explaining the scope of the census, the different data collection methods and other characteristics of the operation, and promoting the participation of those surveyed. During the census, informing about different problems that may occur during the field operation and serving as a hotline to help the respondents. And in the post-census period, as mentioned in previous paragraphs of this section, for the dissemination and popularization of statistics.

Data conflicts

10.24 One of the main objectives of the agriculture census is for benchmarking and for reconciliation of current agricultural statistics with the census data (See Chapter 1, paragraph 1.14b.). In Chapter 2, this

aspect is discussed in paragraphs 2.32-2.36. Indeed, the census of agriculture provides an opportunity to improve current agricultural statistics through data reconciliation. Any data discrepancies and conflicts should be resolved prioritizing census data.

10.25 Data conflicts are unavoidable, and it is important to analyse and address them. These occur when the estimates of some variables from the census differ from those obtained from other sources, such as surveys, expert opinion, or administrative records. These other sources provide current information on variables that change quickly over time. Census data should be given more weight, as they cover the entire population and therefore have no sampling error. Data reconciliation implies not only the checking of data of variables collected in the census vis a vis data of the same variable estimated from other sources but also checking its consistency with correlated data (e.g. international trade).

10.26 Conflicts and discrepancies between census data and current agricultural statistics can be due to different causes which should be adequately identified before any intent of data reconciliation. Sources of discrepancy are (FAO, 2017b):

a) Varying concepts and timeliness: absence of harmonization of concepts and definitions in censuses and surveys, different thresholds and reference periods, reliability of most recent census and surveys, lack of reliability of previous surveys compared to more recent censuses and surveys.

b) Non-sampling errors: out-of-date sampling frames, wrong classification of sampling units, non-response and the solutions applied (change of sampling weights, imputations), inadequate census questionnaires, defective methods of data collection, tabulation, coding, etc.

c) Sampling errors: when estimated confidence intervals from the survey do not cover the census data.

10.27 Therefore, when faced with conflicting data, the first step is to identify the source of the discrepancy. Once it is identified, reconciliation methods can be applied (See FAO, 2017b, Chapter 3). Before applying any reconciliation method, it is important to decide whether the census data should have priority over data from other sources (the usual case because the census is undertaken without sampling error). In such cases, the corresponding census information is “officialised” and the survey designs or non-survey procedures need to be calibrated. More information on how to correct discrepancies can be found in Chapter 25 of the Operational Guidelines (FAO, 2018a).

10.28 The identification of data conflicts and discrepancies and the evaluation of data quality is especially important in countries where regular data productions are based on expert estimates, the censuses are not carried out regularly or are carried out for the first time, and there are considerable discrepancies between regular surveys data and census data. If this analysis is not undertaken, discrepancies may also have adverse consequences. For example, it may cause that census data is not accepted and consequently not used or used below the extent to justify the investment in the census.

Data archiving

10.29 Data archiving is a means of ensuring long-term preservation of data and assists users understand and interpret data. It primarily relates to digital data that 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).

10.30 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.

10.31 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. In addition, archived data must contain information about its quality, so is important to include quality reports, estimated sampling errors in the case of sample modules, results from PES (if applicable), etc.

ANNEXES

ANNEX 1

The agricultural census within the framework of the system of national accounts

The SNA/ISIC framework

The System of National Accounts (SNA) (UN, 2025e) 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.*, 2025). 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 5 (UN, 2025a).

ISIC provides a hierarchical classification of activities. Thus, in ISIC (Rev. 5.), 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. 5) 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. 5) 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. However, countries

can obtain information about the holdings' involvement in post-harvest crop activities in item 0111 "Other economic activities of the household", option "Other: all other ISIC classes not covered in the above categories".

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. 5) 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. 5) 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 of the household (Item 0111)

Item 0111 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. 5.) 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[19]): 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
- 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:

[19] ISIC, Revision 5

- 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

ANNEX 3

International standard industrial classification of all economic activities (ISIC[20]): aquaculture

This annex is relevant to WCA 2030 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

[20] ISIC, Revision 5

ANNEX 4

Additional Items of WCA 2030

This annex provides a description of the concepts and definitions for the additional items shown by theme in Chapter 6. The concepts and definitions are based on international standards, where applicable. However, countries should refer to AGRISurvey (FAO, 2025a) for more precise definitions of additional items and implementation approaches in agricultural surveys (see Chapter 2, paragraphs 2.59-2.62). As explained in Chapter 6, additional items are better collected on a sample basis, either in sample census modules or follow up surveys. The chapter proposes a decision tree that countries are encouraged to use to support the decision on whether an item is a census or a survey item.

Theme 1 : Identification and general characteristics

0102 RESPONDENT FOR THE AGRICULTURAL HOLDING

Reference period: census reference day

1. Respondent is the person from whom data are collected about the agricultural holding. 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 manager. The name and the position of the respondent in the holding are usually asked.

0108 AGRICULTURAL TRAINING/ EDUCATION OF THE HOLDER

Reference period: census reference day

2. 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.

3. 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.

0109 NATIONAL/ETHNIC GROUP OF AGRICULTURAL HOLDER

Reference period: census reference day

4. The collection of data regarding the national or ethnic group of households has become increasingly pertinent for countries, especially in the context of shaping migration policies, fostering integration, and addressing minority concerns. The decision to collect data and disseminate information about the ethnic or national composition of a population in a census is contingent on various factors and national circumstances. These factors may include the specific needs of the country for such data, as well as the suitability and sensitivity of incorporating ethnicity-related questions in the census. For

further insights into the definition of ethnicity, one can refer to the Principles and Recommendations for Population and Housing Censuses (UN, 2025d), specifically detailed in section D, paragraph 5.202.

5. 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 agricultural holder, which in the household sector is usually the household head. 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.

0112 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

6. 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 essential item 0111 (paragraphs 7.1.24 – 7.1.26), 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.

7. 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.

8. According to Principles and Recommendations for Population and Housing Censuses (UN, 2025d), **household income** may be defined as all receipts whether monetary or in kind (goods and services) that are received by the household or by individual members of the household at annual or more frequent intervals but excluding windfall gains and other such irregular and typically one-time receipts. Household income covers:

(a) income from employment (both paid and self-employment);
(b) income from the production of goods for own final use;
(c) income from the provision of household services for own final use;
(d) property income; and
(e) current transfers received.

0113 MAIN AGRICULTURAL ACTIVITY OF THE HOLDING

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

Reference period: census reference year

9. 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.

10. 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.

11. 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 this item.

0114 PRESENCE OF MANAGER OTHER THAN THE HOLDER

. Reference period: census reference day

12. The **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. A distinction should be made between an agricultural holder and a manager different from the holder (see paragraph 4.22). Usually, in the household sector the manager and the holder are the same person. In case they are not, the manager could be a paid employee (hired manager) or a non-paid person (a family member or another person). The hired manager's remuneration may be in the form of wages or in-kind payments. This item could be useful in building sampling frames for sample surveys analyzing types of management of holdings.

0115 SEX OF MANAGER OTHER THAN HOLDER

- *Male*
- *Female*

Reference period: census reference day

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

0116 AGE OF MANAGER OTHER THAN HOLDER

Reference period: census reference day

14. Age of manager is important for studying the relationship between age and the characteristics of agricultural holdings and, to compare the agricultural practices used by young and old managers. Age refers to the interval between the date of birth and the date of the census, expressed in completed solar years (UN, 2025d, paragraph 5.169). This item could be useful as a stratification variable for ongoing surveys.

Theme 2 : Land

0202 NUMBER OF PARCELS

Reference period: census reference day

1. Similar to total area of the holding (item 0201), number of parcels is a new item that provides information on the extent of agricultural activities in the holding. Number of parcels (see paragraph 4.18) used by the holding for agricultural purposes must be included, regardless of their land tenure status.

2. The number of parcels used by the holding is important for building frames for agricultural surveys. Land parcelling out is important to understand managerial characteristics of holdings. In some countries, holdings consist of many parcels operated by different members of extended households and also under different forms of tenure. For example, the design of sample surveys on crop or livestock production yields, could be improved with data about highly and small parcelled holdings.

0205 LOCATION (for each parcel)

Reference period: census reference day

3. As mentioned in paragraph 4.18, 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.

4. 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.

5. 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 7.1.2). 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 7.1.2 – 7.1.4.

0206 AREA (for each parcel)

Reference period: census reference day

6. 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 4.18. For information on how to determine the area of a holding, see paragraphs 7.2.1-7.2.7. Note that the sum of the parcel areas must be equal to the total area of the holding.

0207 SEX OF HOUSEHOLD MEMBER(S) MANAGING THE PARCEL (for each parcel)

Reference period: census reference day

7. This item is useful to identify the intrahousehold distribution of managerial decisions and ownership of parcels of the holding. The role of gender in the management of the parcel is complemented with parcel area (item 0206) and tenure (item 0209). The understanding of this role should lead to improved gender sensitivity in policies and programmes.

8. This item collects the sex of any household members (not just the holder or joint holder) making managerial decisions at the parcel level. If the parcel is managed by different household members, persons, the sex of the each of them could be taken. 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
- Marketing of crops growing on this parcel
- Types of inputs used (fertilizers, pesticides, irrigation, hired labour, etc.)

9. Countries may wish 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.

0208 LAND USE (for each parcel)

Reference period: census reference year

10. As mentioned in paragraph 7.2.16, land use data are often collected at the parcel level. This item serves this purpose. Land use classes, as recommended and defined in essential Item 0203 (paragraphs 7.2.8 – 7.2.37), should be used. In conjunction with the parcel area (additional item 0206), the information collected in this item can be used to estimate the area under different land use classes.

0209 LAND TENURE (for each parcel)

- *Legal ownership or legal owner-like possession*
- *Non-legal ownership or non-legal owner-like possession*
- *Rented from someone else*
    - *Rented-in, leased or sharecropped with written agreement*
    - *Rented-in, leased or sharecropped without written agreement*
- *Other types of land tenure*
    - *State or common land used with written agreement (certified use rights)*
    - *State or common land used without written agreement (uncertified use rights)*
    - *Occupied/squatted without any permission*

Reference period: census reference day

11. Item 0203 "Area of holding according to land tenure types" was recommended in Chapter 6 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. Countries wishing to get information about the efficiency of their official land registration system may go into more detail and ask about whether the parcel is officially registered or not. This may not be relevant to all land tenure types. If the parcel is under land tenure type "rented from someone else" or "non-legal ownership or non-legal owner-like possession", the respondent might not be aware of its registration status.

12. Note that a parcel must be of one tenure type (paragraph 4.18). Refer to paragraphs 7.2.38 – 7.2.46 for definitions of land tenure and a description of the different land tenure types.

0210 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

13. This item relates to the conditions under which land is rented from others. It applies to parcels "rented from someone else" in additional Item 0209 (see above) and refers to the current rental arrangements (as of census reference day). See paragraph 7.2.42 of essential item 0204 for the description of the above four forms of rental arrangements.

0211 USE OF SHIFTING CULTIVATION (for each parcel)

Reference period: census reference year

14. 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".

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

0212 NUMBER OF YEARS SINCE CLEARED (for each parcel)

Additional item. Reference period: census reference day

16. 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.

17. 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.

Theme 3: Irrigation

0301 USE OF IRRIGATION ON THE HOLDING: FULLY AND PARTIALLY CONTROLLED IRRIGATION

Reference period: census reference year

1. The definition of irrigation is provided in paragraphs 7.3.1 to 7.3.3 and the item refers to both fully controlled and partially controlled irrigation methods. This item also helps to better understand cropping practices and the constraints in improving agricultural productivity. It is recommended to include this item in the core module when using a modular approach, to provide a sampling frame for the census supplementary irrigation module and for other irrigation surveys. Countries wishing to set up a list frame of holdings using irrigation may collect this item in the census by complete enumeration to support the design of specific sample surveys on this type of holdings.

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*
  1. *Single-irrigated crop*
  2. *Multiple-irrigated crops*
- *Land under temporary meadows and pastures*
- *Land under permanent meadows and pastures*

Reference period: census reference year

2. See paragraphs 7.3.1 - 7.3.3 for the definition of irrigation and 7.3.5 for the definition of area irrigated. This item includes areas actually irrigated by both fully controlled and partially controlled irrigation. See paragraph 7.2.26 for the definition of “land under permanent crops”, paragraph 7.2.18 for the definition of “land under temporary crops”, paragraph 7.2.21 for the definition of “land under temporary meadows and pastures” and paragraph 7.2.27 for the definition of “land under permanent meadows and pastures”. Crops grown under protective cover should be included under the category “land under farm buildings and farmyards, as indicated in the definition.

3. Note that area irrigated in this item refers to the physical area of land irrigated, not the total area of crops irrigated (see additional 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 is 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.

4. 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

5. See paragraphs 1 and 2 above for more information on land irrigated.

6. This item includes only areas of land irrigated by fully controlled irrigation methods. Surface irrigation refers to a method of irrigation in which water is applied to the land by allowing it to flow by simple gravity, before infiltrating. There are several 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.

7. 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. 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 or adjacent to each plant. There are three main categories: 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

9. This item includes only areas of crops irrigated by fully controlled irrigation methods. This item refers to the area of crops irrigated, as opposed to the area of land irrigated given in Items 0302 (essential), 0303 and 0304 (see paragraphs 2-8 above). 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 essential Item 0302 and 0.8 ha of crops irrigated in this item. Analysis of the irrigated crop area in relation to the land irrigated provides information on cropping intensity under irrigation.

10. For temporary crops, this item refers to that portion of the harvested area (see paragraphs 7.4.4-7.4.15) irrigated at any time during the reference period. For permanent crops, this item refers to the portion of the area of permanent crops present on the *census reference day* (see paragraph 7.4.17) that was irrigated at some time during the reference period.

0306 SOURCES OF IRRIGATION WATER: FULLY CONTROLLED IRRIGATION (for the holding)

- *Surface water*
- *Groundwater*
- *Mixed surface water and groundwater*
- *Municipal water supply*
- *Treated or not-treated wastewater*
- *Agricultural drainage water*
- *Desalinated water*
- *Other*

Reference period: census reference year

11. This item includes only areas of land irrigated by fully controlled irrigation methods. 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.

12. 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, reservoirs, ponds, streams, lakes, impoundments, wetlands and estuaries. 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 usually charged for access to this source. Treated wastewater is water with no further immediate value for 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. Agricultural drainage water is water withdrawn for agriculture but not consumed and then returned (it can be recovered and reused). Desalinated water is water produced by desalination of brackish or salt water. For more information see AQUASTAT - FAO's Global Information System on Water and Agriculture (FAO, 2025c).

13. 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 further elaborate the classes given to meet their needs.

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

14. 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.

0308 USE OF OTHER TYPES OF IRRIGATION: PARTIALLY CONTROLLED IRRIGATION (for the holding)

1. *Equipped wetland and inland valley bottoms*
2. *Equipped flood recession cultivation*
3. *Spate irrigation*
4. *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.

15. 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.

16. Wetland and inland valley bottoms are lowland areas subject to seasonal flooding that are used

for crops when covered with water. Water control structures, such as canals, may be constructed to aid crop cultivation, in which case this falls in the partially controlled irrigation category.

17. Flood recession refers to areas along the edges of rivers or other bodies of water where crops are grown, taking advantage of receding floods water. Floating rice is included as a flood recession crop. Structures may be built to retain receding water; in which case this falls in the partially controlled irrigation category.

18. Spate irrigation is a method of random irrigation that uses floodwaters from 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 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 seasonal rivers to 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.

19. Other irrigation may include, for example, manual watering of plants using buckets, watering cans or other devices.

0309 AREA EQUIPPED FOR IRRIGATION IN WORKING ORDER: FULLY AND PARTIALLY CONTROLLED IRRIGATION

Reference Period: census reference day

20. 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.

21. Unlike essential Item 0302 (paragraphs 7.3.5 – 7.3.6), 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.

22. 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

23. 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.

24. 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 flooding. 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 waterlogging. Management of water for flood recession cropping (additional Item 0308) is considered partially controlled irrigation, not drainage.

Theme 4: Crops

0401 TYPES OF TEMPORARY CROPS ON THE HOLDING

Reference period: census reference year

1. The information on temporary crops is limited to whether the holding grew each specific type of crop. This item is useful to provide a sampling frame for crop surveys. Area data for temporary crops are collected in Items 0402 and 0403.

2. Temporary crops are those with a less than one-year growing cycle (see paragraphs 7.2.18 and 7.2.19). A census provides a unique opportunity to collect information on all crops grown, including the minor crops. In an agriculture survey, data on minor crops are likely to be less reliable and so only the major crops should be canvassed.

3. A crop classification is shown in Annex 6 to assist in collecting and tabulating crop data. An alphabetical list of crop names is given in Annex 7. 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, considering 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 6 for more information on the principles underlying the crop classification and the problems in providing further detail.

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 7.4.6 and 7.4.7). See paragraphs 4.15 – 4.16 for more information on how to report crops where land is bought.

0404 AREA OF TEMPORARY CROPS HARVESTED ACCORDING TO END USE (for each selected crop type)

Reference period: census reference year

5. 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*

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

7. 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 6 and the alphabetical list of crops in Annex 7. Other countries may wish to identify other uses of crops, such as for production of seeds (“seed fields”), as fibre for medicinal purposes, etc. The reference period should be consistent with essential Item 0403 (paragraphs 7.4.4 – 7.4.15), usually the census reference year.

0405 PRODUCTION OF TEMPORARY CROPS HARVESTED (for each selected crop type)

Reference period: census reference year

8. Collecting production in the census of agriculture is not advisable. Surveys are more appropriate means to collect this time-consuming data. If countries must collect this type of data, it is preferable that production for only a few selected crops be collected on a sample basis. Countries should choose the crops according to their needs. Production data in an agricultural census are useful as benchmarks for current crop production statistics.

9. 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).

0406 PRESENCE OF HYDROPONIC/VERTICAL FARMING

Reference period: census reference day

10. This new item refers to whether some area of the holding was used for growing crops under hydroponic or vertical method during the census reference year. Vertical farming refers to crop production in vertically stacked "land" in a controlled environment that provides suitable light, water, nutrients, and heat adjusted by electronic sensors (Esposito et al., 2017; FAO et al., 2022). Countries wishing to set up a list frame of holdings practicing hydroponic/vertical farming may collect this item in the census by complete enumeration to support the design of specific sample surveys on this type of holdings.

11. There are three main system types for vertical farming: (1) **hydroponic**, (2) **aquaponic**, and (3) **aeroponic.**

- **Hydroponic**: it covers a range of methods used to grow agricultural crops without using soil. Instead of soil, various inert growing media, also called substrates, are used. It includes growing plants either on a substrate or bare roots in an aqueous medium.
- **Aquaponic**: integrates recirculating aquaculture and hydroponics in one production system. Aquaponics uses fish (tilapia being the most common) to generate nitrate-rich plant food.
- **Aeroponic**: it is a way of farming in which roots are suspended on the air and grow in a humid environment without soil. The plants are sprayed with water and nutrient solution.

0407 TYPES OF PERMANENT CROPS ON THE HOLDING AND WHETHER IN COMPACT PLANTATIONS

Reference period: census reference day

12. 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 0408–0411. Some countries may wish to include more detailed data according to national needs.

13. Permanent crops are crops with a more than one-year growing cycle (see paragraph 7.2.25). 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 (or forming an irregular pattern, but densely enough to be considered an orchard), to which a specific area can be attributed.

14. Countries should refer to Annexes 6 and 7 for a list of crops. Countries should expand or abridge the crop list as appropriate, considering their circumstances and data needs (see Annex 4, theme 4, paragraph 3).

0410 AREA OF PRODUCTIVE PERMANENT CROPS IN COMPACT PLANTATIONS ACCORDING TO END USE (for each selected permanent crop type)

Reference period: census reference day

15. End use refers to the purpose of the crop (see paragraph 3 above). 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

16. For the definitions of permanent crops and compact plantation, see paragraph 7.4.16. For information on area of permanent crops, see paragraphs 7.4.16 – 7.4.20. For the definition of permanent crops of productive age, see paragraph 7.4.18. 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 6 and the alphabetical list of crops in Annex 7.

0411 PRODUCTION OF PERMANENT CROPS (for each selected permanent crop type)

Reference period: census reference year

17. See paragraph 8 above for information on production data in the agricultural census. Production refers to the actual quantity of product, ready for sale or consumption (see paragraph 9 above).

0412 AREA OF LAND USED TO GROW TEMPORARY CROPS AS A SECONDARY LAND USE (for the holding)

Reference period: census reference year

18. Most temporary crops are grown on land classed as having “land under temporary crops” as its main use in the land use classification (see paragraphs 7.2.14 – 7.2.16). 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.

19. 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 7.4.2 and 7.4.10 to 7.4.14). 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.

20. 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.

0414 AREA FERTILIZED FOR EACH TYPE OF FERTILIZER AND MAJOR CROP TYPE (for the holding)

Reference period: census reference year

21. This item refers to the area of crops fertilized, according to the definition of fertilizers in essential Item 0413 (see paragraphs 7.4.23 – 7.4.30). For temporary crops, the area fertilized refers to that part of the area harvested to which fertilizers were applied sometime 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.

0415 PRESENCE OF NURSERIES (for the holding)

Reference period: census reference year

22. 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 seed fields (see paragraph 7.4.5).

23. This item refers to whether some area of holding was used as nursery during the census reference year. Countries wishing to set up a list frame of holdings with nurseries may collect this item in the census by complete enumeration to support the design of specific sample surveys on this type of holding.

0416 AREA OF NURSERIES (for the holding)

Reference period: census reference year

24. For a definition of nursery, please refer to paragraph 22 above. Plants in a nursery are not harvested and are therefore not included in the area harvested ("temporary crops" in essential Item 0403 (paragraphs 7.4.4 – 7.4.15)), or current area ("permanent crops" in essential Item 0408 (paragraphs 7.4.16 – 7.4.20)). 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.

0417 PRESENCE OF CROPPED LAND UNDER PROTECTIVE COVER (for the holding)

Reference period: census reference year

25. Cropped land under protective cover is land used for agriculture 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.

26. This item refers to whether some area of the holding was used for growing crops under protective cover during the census reference year. Countries wishing to set up a list frame of holdings growing crops under protective cover may collect this item in the census by complete enumeration to support the design of specific sample surveys on this type of holdings.

0418 AREA OF CROPPED LAND UNDER PROTECTIVE COVER (for the holding)

Reference period: census reference year

27. For a definition of cropped land under protective cover, refer to paragraph 25 above. This item relates to area of land used for growing crops under protective cover during the census reference year. If a piece of land under protective cover was used for growing different crops during the census reference year, it will be counted only once.

Theme 5: Livestock

0504 NUMBER OF ANIMALS BY SEX OF THE HOUSEHOLD MEMBER MANAGING THEM (for each livestock species)

Reference period: census reference day

1. The purpose of this item is mainly to understand the role of gender in the distribution of managerial decisions on the holding regarding livestock. This item complements Item 0207 regarding the sex of the household member managing the parcel (see Theme 2). Countries might collect data for this item by identifying, for each household member, the numbers and types of livestock under his/her sole or joint management. It may be suitable to group livestock into broad categories based on the Classification of Livestock given in Annex 8. 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*

2. Alternatively, countries could collect this item by indicating, out of the total number of each livestock species collected in essential Item 0502, the number under the management of a male or female household members or jointly managed by male and female household members, not only by the holder or joint holders.

0505 NUMBER OF ANIMALS PER BREED CATEGORY (for each livestock species)

Reference period: census reference day

3. Some countries may wish to also collect number of animals per breed for species that are important to them. Breed is defined as "either a sub-specific group of domestic livestock with definable and identifiable external characteristics that enable it to be separated by visual appraisal from other similarly defined groups within the same species or a group for which geographical and/or cultural separation from phenotypically similar groups has led to acceptance of its separate identity" (FAO, 2012). Countries might want to distinguish between basic categories (FAO, 2005b):

- **Locally adapted breeds**: "which have been in the country for a sufficient time to be genetically adapted to one or more of traditional production systems or environments in the country."
- **Indigenous breeds**, also termed autochthonous or native breeds: "originating from, adapted to and utilized in a particular geographical region, form a subset of the Locally Adapted Breeds."
- **Exotic breeds**: "which are maintained in a different area from the one they were developed and including breeds that are not locally adapted. Exotic breeds comprise both recently introduced breeds and continually imported breeds."

4. It needs to be noted that not all animals can always be classified under a specific breed as they might belong to an "undescribed" or "crossbred" population.

0506 NUMBER OF ANIMALS: AGE AND SEX (for each livestock species)

Reference period: census reference day

5. Age of livestock data are collected in suitable age groupings, depending on the livestock species 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.

6. Countries often collect age and sex data only for the major livestock species. For some livestock species, 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.

0507 NUMBER OF ANIMALS ACCORDING TO PURPOSE (for each livestock species)

Reference period: census reference day

7. Purpose refers to the main reason for the animals being kept. This is usually straightforward for large farms and enterprises, as specific breeds of animal are used for certain purposes. The specific purposes recorded will depend on the livestock species 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. 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 species only.

0508 NUMBER OF MILKING ANIMALS ACCORDING TO MILK STATUS (for each livestock species raised for milking)

- *In milk*
- *Dry*

Reference period: census reference day

9. This item relates to the livestock species raised for milking, as identified above in additional Item 0507. For the purposes of the agricultural census, a milking animal is defined as an animal present on the census reference day 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 census reference day.

0509 NUMBER OF ANIMALS BORN (for each livestock species)
0510 NUMBER OF ANIMALS ACQUIRED (for each livestock species)
0511 NUMBER OF ANIMALS SLAUGHTERED (for each livestock species)
0512 NUMBER OF ANIMALS DISPOSED OF (for each livestock species)

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

0513 NUMBER OF ANIMALS THAT HAVE DIED FROM NATURAL CAUSES (for each livestock species)
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.

10. 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 species to be covered by these data, according to national conditions.

11. 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 livestock species and operational factors: one-year reference period – normally, the census reference year – for large animals; a six-month reference period for smaller animals; and a one-month reference period for poultry (see above).

12. 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.

13. 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.

14. Number of animals slaughtered refers to the number of slaughtering during the reference period of animals that were being raised on the holding. This includes slaughtering carried out on the holding, as well as slaughtering 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 additional Item 0512. Slaughtering of other people's animals on the holding should not be included.

15. Number of animals disposed of refers to sales or other disposals during the reference period 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 disposals 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. Slaughtering carried out on a fee basis by, for example, a butcher on behalf of the holding should be included under slaughtering in additional Item 0511. Other disposals cover sales and other disposals, such as gifts or as payment for services that do not involve slaughtering.

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

0514 TYPES OF FEED (for each livestock species)

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

Reference period: census reference year

17. Countries should decide on the livestock species to be covered by this item, according to national conditions. Type of feed refers to the source of feed for the livestock species for a given reference period, usually the census reference year. For more information, see Gerber et al., 2013. More than one type of feed may be used for a specific livestock species 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 using prepared feed during the winter. For information on animal grazing practices see additional Item 0614 "Type of animal grazing practices" (see Theme 6 below).

18. *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.

0515 USE OF VETERINARY SERVICES (for the holding)

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

Reference period: census reference year

19. *Veterinary services* cover 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.

20. 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 species can help in assessing the animal health situation of each livestock species. Countries collect data in the form suited to their needs.

Theme 06: Agricultural practices

0602 USE OF SEEDS PRODUCED BY MODERN BIOTECHNOLOGIES (for the holding)

Reference period: census reference year

1. Item 0602 relates to whether any seeds produced by modern biotechnologies were used on the holding. It refers to crops grown from seeds, which possess a novel combination of genetic material obtained through the use of modern biotechnology. This includes genetically modified seeds and gene-edited seeds. Countries wishing to set up a list frame of holdings using seeds produced by modern biotechnologies may collect this item in the census by complete enumeration to support the design of specific sample surveys on this type of holdings.

0603 USE OF SEEDS PRODUCED BY MODERN BIOTECHNOLOGIES ACCORDING TO CROP TYPE (for the holding)

Reference period: census reference year

2. This item relates to what types of seeds produced by modern biotechnologies were used on the holding. It identifies the specific types of crops that are grown using these seeds.

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

3. 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.

4. Identification in the category “For storing agricultural products (area or volume)” together with the detailed categories of essential Item 0110 “Main purpose of production of the holding” (paragraphs 7.1.20 – 7.1.23) 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.

5. 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

6. 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 to 19 percent, 20 to 49 percent, 50 percent or more.

0607 USE OF ORGANIC AGRICULTURAL PRACTICES (for the holding)

Reference period: Census reference day

7. **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, 2006).

8. 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.

9. 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 (FAO & WHO, 2006) 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.

10. 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) (IFOAM, 2025). 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 that certification allows access to could be asked, if it is 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.

11. 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).

12. 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.

13. This item would facilitate the conduct of surveys or supplementary modules for in-depth assessments of the use of organic practices and their characteristics.

1105 WHETHER AGROFORESTRY IS PRACTISED (for the holding)

Reference period: census reference year

14. This item is defined in Theme 11 Forestry: Item 1105. The presence of agroforestry on the holding constitutes a sustainable agriculture practice through its impact on soil, water, plant, animal and atmospheric relations. Countries wishing to set up a list frame of holdings practicing agroforestry may collect this item in the census by complete enumeration to support the design of specific sample surveys on this type of holding.

0301 USE OF IRRIGATION ON THE HOLDING: FULLY AND PARTIALLY CONTROLLED IRRIGATION

Reference period: census reference year

15. This item is covered in Theme 3: Irrigation. The use of irrigation helps to better understand cropping practices and the constraints in improving agricultural productivity.

0608 TYPE OF SEED FOR EACH MAJOR CROP TYPE (for the holding)

- *Certified seed from the formal seed sector*
- Seed from the formal sector, with quality control, but not certified
- *Seed from farmers seed systems.*

Reference period: census reference year

16. This item refers to whether the seed used has had its quality tested, either by a certification system or by another quality control system like truth in labelling or quality declared seed or it has been acquired through an informal seed system without quality control and whether it belongs to a modern or farmer's variety. For more information on seeds, refer to additional item 0609 below. The reference period is the census reference year.

17. 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.

18. Seed quality control may be done through certification when an independent body inspects the field and tests seed in laboratory or by company declaration, also known as quality declared seed where the same producer does the inspection. Seed without a formally recognized quality control mechanism 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.

19. 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 well adapted to 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

0610 TYPES OF TILLAGE PRACTICES (for the holding)

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

Reference period: census reference year

20. Tillage refers to arable land of the holding sown/cultivated in the census reference year (see paragraph 7.2.14, Figure 7.1, 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.

21. 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 (see additional item 0611 below). For the purposes of the agriculture census, the following groupings are identified to reflect this

continuum.

22. 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.

23. 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.

24. 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.

25. 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.

26. 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

27. 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 (additional Item 0610) carried out in combination with useful crop rotations (additional 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

28. 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.

29. 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.

30. 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.

0613 USE OF TECHNOLOGY ON THE HOLDING

- Automated guidance steering systems (auto-steer) on farm equipment
- Geographic Information Systems (GIS) and Mapping tools
- Use of drones in crops and livestock monitor and field surveillance
- Vertical farming (see Item 0406)
- Automatic dairy installations
- Automatic feeder systems
- Automatic irrigation systems
- Robotic greenhouse equipment
- Artificial intelligence (AI) for disease and pest management
- Mobile applications and alerts (SMS, WhatsApp, etc.) for weather forecasting, market conditions, advisory, etc.
- Renewable energy sources for in-farm energy needs

Reference period: census reference year

31. The use of new technologies and innovations in agricultural practices has accelerated in the past decade and it is profiling as a structural characteristic of modern agriculture. This new item is introduced considering that the extent of the use of new technology in farming is still low in many countries (rare event), and then the agricultural census may be an appropriate place for collecting this type of data.

32. The use of technology in farming practices refers to the incorporation of information and communications technologies (ICT) to increase efficiency, productivity, and sustainability in agricultural production. It includes the employment of advanced techniques such as precision agriculture, automatic controlled irrigation, precise animal health control, remote control for the physical security surveillance etc. Different means are employed: drones, Geographic Information Systems, artificial intelligence, cameras, etc.

33. "Smart farming" is a broad concept involving the automatization of the crop or livestock production cycle by means of these mechanisms (FAO, 2022c).

34. "Precision agriculture" is an agriculture managing strategy that assists farmers in making decisions based on observations and measures of crops and soil conditions and microclimate for every variable of crop farming. Precision agriculture can centrally manage fields by processing and analysing the information collected over time, space and individuals. Through the overall control of all field conditions, diversified management decisions are made for the sub-area fields, including adjusting the amount of fertilizer, farming time, optimizing technology, etc., and ultimately improve production

efficiency, production quality, farmers' profit and the sustainability of agricultural production. Precision agriculture is based in several resources (FAO, 2022c):

- Automated guidance steering systems (auto-steer) on farm equipment. Tractor autosteer is a programmed tractor guidance system that does the job precisely as expected, avoiding human errors and with great precision.
- Geographic Information Systems (GIS) used for precise mapping on soil quality, yields and vegetation among others.
- Use of drones. Drones can scan a field from above and report problems like crop health status, pests, infections and lack of nutrients and general information on the state of fields and plots. They can also be used for monitoring livestock movement.
- Vertical farming (see item 0406).
- Weather Forecasting Apps. Utilizing mobile or web applications with real-time and accurate information to make informed decisions about farmer's operations.
- Automatic irrigation systems. Utilization of advanced systems designed to efficiently manage water resources, reduce labour, and ensure that plants receive the right amount of water at the right time.
- AI for disease and pest management. Utilizing AI in agriculture for disease and pest management, control and/or for more efficient and proactive approaches in crop protection.
- Blockchain technology. The use of Blockchain for creating transparent and traceable supply chains and automated and secure contracts for transactions within the supply chain.
- Utilization of the camera for physical security surveillance. Cameras Implementing for security and monitoring purposes.
- Renewable Energy Sources for in-farm energy needs. Use of renewable energy sources on the farm (ex-solar powered irrigation system) for sustainability, cost savings, and reduction of the environmental impact.

35. The use of new advanced technologies also reaches animal production. In this respect some resources are:

- Automatic dairy installations which allow to milk cows automatically without human intervention preserving the hygiene and health of the milked animals.
- Automatic animal feeders that provide animals with feed tailored to their specific needs and in the right amount.

36. In the case of greenhouses, modern tech-heavy equipment, using automated control systems and robots to perfectly tailor the growing environment are increasingly used.

0614. TYPE OF ANIMAL GRAZING PRACTICES

Reference period: census reference year

37. Animal grazing is practically the only source of feed for livestock raised under the grazing system (see essential Item 0501 “Type of livestock production system”, paragraph 7.5.3). 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.

38. 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 Greenhouse gases (GHG) agriculture emissions globally, as well as in many countries where livestock is a dominant production activity.

39. 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

40. 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.

41. 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.

42. 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.

43. 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 9 months
- More than 9 months

44. 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.

0615. MANURE APPLICATION

Reference period: census reference year

45. This item is relevant for the calculation of agro-environmental indicators and particularly for Greenhouse gases and ammonia emissions. It is not applicable to holdings with a nomadic livestock system (see essential Item 0501 “Type of livestock production system” in Chapter 7).

- 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 48 below)

0616 MANURE MANAGEMENT SYSTEM

Reference period: census reference year

46. This item is relevant for the calculation of agro-environmental indicators and particularly for Greenhouse gases and ammonia emissions. It is not applicable to holdings with a nomadic livestock production system (see essential Item 0501 “Type of livestock production 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

47. 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.

48. 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 CO_2 and CH_4, which may be captured and flared or used for energy production.

0414 AREA FERTILIZED FOR EACH TYPE OF FERTILIZER AND MAJOR CROP TYPE (for the holding)

Reference period: census reference year

49. This additional 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 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
- No collateral

Reference period: census reference year

0704 PERIOD OF LOAN OR CREDIT (FOR THE HOLDING)

Reference period: census reference year

1. Credit for agricultural purposes encompasses any form of credit that has been authorized and is accessible for activities directly associated with the functioning of the agricultural holding. This includes credit used for procuring agricultural inputs for both crops and livestock, funding the construction of agricultural structures, acquiring agricultural machinery, and securing working capital for daily farm operations. It is important to note that credit unrelated to agricultural operations, such as financing the holder's residential property, supporting other family businesses, or covering personal consumption expenses, should be expressly excluded from credit for agricultural purposes.

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.

3. The term "credit" refers to a broad range of financial arrangements, including the approved ability to borrow money directly and the practice of purchasing goods and services on credit terms. Borrowing money can occur through various channels, such as financial institutions, other entities, or individuals, and it is typically intended for specific purposes, such as acquiring assets like a tractor. Buying goods and services on credit, on the other hand, involves an agreement in which payment is postponed beyond the point of delivery. For example, this could entail purchasing fertilizer with the understanding that payment will be made after the crop's harvest.

4. Within the context of credit, the concept of a "loan" is a subset and pertains to financial resources provided in the form of cash from either formal or informal sources. It is important to note that credit extends beyond cash loans and covers loans provided in-kind, which may take the form of inputs, equipment, or machinery, among other things.

5. Additional 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
- Buyer/Trader
- Other sources

6. In additional Item 0703, collateral is defined as assets offered as security when obtaining a loan. This means that if the borrower fails to meet the loan’s terms, the collateral can be sold, and the resulting funds used to settle the loan. In the context of the agricultural census, collateral is applied more broadly to include a guarantee provided for the acquisition of goods and services. While this guarantee typically relates to the production of agricultural goods, it may also involve assets.

7. 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. Additionally, a different form of collateral covers the acquisition of goods and services on credit, where payment is agreed upon for a future date, or when credit is extended without requiring collateral, solely relying on a personal guarantee. It is worth noting that sometimes it is possible for a farmer to obtain credit or a loan with no collateral, particularly through government-backed agricultural financing schemes or cooperative credit institutions.

8. 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
- Input agencies
- Online information (internet)
- Mobile phone
- Other farmers
- Other

Reference period: census reference year

9. 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.

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

0706 SOURCES OF AGRICULTURAL EXTENSION SERVICES USED (FOR THE HOLDING)

Reference period: census reference year

11. 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.

12. In most countries, the government serves as the primary provider of extension services through its network of agricultural field staff. However, there is a growing trend towards the utilization of fee-based private extension services offered by specialized firms and input suppliers in some countries. These private extension services are becoming increasingly significant and are being adopted by farmers seeking tailored expertise and support beyond what traditional government channels offer. 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.

13. There are various approaches to delivering extension services. Extension workers frequently make farm visits to offer immediate guidance. Occasionally, small groups of farmers are organized for demonstrations of new farming methods or technologies, while more structured training programs may be conducted for larger farmer groups. Additionally, study tours are sometimes arranged for farmers to observe agricultural practices in different regions. Agricultural extension services are typically provided to farmers free of charge, although exceptions may apply.

14. Additional 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 and social media 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 through 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.

15. The categorization of sources for agricultural extension services will vary depending on the organization of these services within each country. Countries may opt to categorize them based on the specific discipline, like crops or livestock, and the type of providing organization, whether it is a government institution or a 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

16. 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

17. Sometimes, travelling times vary according to, for example, the wet and dry seasons. Some countries may wish to collect these data for different seasons. There may be different modes of travel, such as walking, a motor vehicle, an animal-powered vehicle, bus, bicycle, etc. The specific list of modes depends on the country's circumstances. If more than one mode of travel is available, then the most usual mode and travelling time associated with it should be reported.

18. 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.

0708 TYPE OF INSURANCE COVERAGE (FOR THE HOLDING)

- No insurance coverage
- Insurance related to crop production.
- Insurance related to livestock production.
- Other insurance related to crop or livestock production.

Reference period: census reference year

19. The purpose of this new item is determining the use of insurance coverage in agricultural holdings. It helps assess the level of financial protection available to farmers against potential losses that can significantly impact their livelihoods.

20. Insurance related to crop production covers insurance specifically related to protection against risks, such as adverse weather conditions (e.g., droughts, floods, storms), pests, and diseases that can harm crops. Insurance related to livestock production encompasses insurance that helps mitigate the financial impact of livestock losses due to risks such as diseases, accidents, or natural disasters. Other insurance related to crop or livestock production may include additional insurance types or coverage that are not explicitly covered by the above two categories. It could involve insurance for farm equipment, infrastructure, or other aspects of agricultural production.

Theme 8: Demographic and social characteristics

0801 SEX (for each household member)

- *Male*
- *Female*

Reference period: census reference day

0802 AGE (for each household member)

Reference period: census reference day

1. Age refers to the interval between the date of birth and the date of the census, expressed in completed solar years. (UN, 2025d, paragraph 5.169). Data on age may be collected by asking directly for the age at the person's last birthday or by obtaining the person's date of birth (year, month and day). Age data are sometimes difficult to collect. In some countries, people have different ways of calculating age, such as age at last 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.

0803 RELATIONSHIP TO HOUSEHOLD HEAD OR OTHER REFERENCE PERSON (for each household member)

Reference period: census reference day

2. 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 household sector, the agricultural holder is usually the household head. 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.

3. The relationship categories should be based on international standards used in the population census programme (UN, 2025d, paragraph 5.149), 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*
- *Other relative*
- *Other unrelated person*

4. Households should be divided into household composition types based on the family nucleus. The following groupings used in the population census (UN, 2025d, paragraph 5.159) 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

– Other
– Unknown or not stated

0804 MARITAL STATUS (for each household member)

Reference period: census reference day

5. 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, 2025d, paragraph 5.182), to ensure consistency with other national statistics. The following groupings are recommended:

– Never married
– Married
– Married, but separated
– Divorced and not remarried
– Widowed and not remarried

6. Countries may wish to take local conditions into account in determining marital status categories. In some countries, customary unions such as ‘’registered partnership’’ and “consensual union” may be needed to reflect unions, which are legal and binding under the law. Other countries may need to take into account concubinage, polygamous or polyandrous practices.

7. 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.

0805 EDUCATIONAL ATTAINMENT (for each household member, excluding holder and spouse)

Reference period: census reference day

8. 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 successfully completed by a person. In the agricultural census, educational attainment data should be collected for each household member, as the educational levels can be important factors in agricultural and household activities.

9. 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 four levels of education (UNESCO, 2011, paragraph 89, table 1): less than primary (for persons not having successfully completed primary education), primary, secondary (comprising lower and upper secondary education levels), and post-secondary (comprising post-secondary non-tertiary education, short-cycle tertiary education, bachelors or equivalent level, master’s or equivalent level, doctoral or equivalent level). Each level may be further subdivided to meet national needs.

Theme 9: Work on the holding

0904 FORM OF PAYMENT FOR EMPLOYEES (for the holding)

Reference period: census reference year

1. Additional Item 0904 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*

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

Theme 10: Aquaculture

1002 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

1. 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.

2. 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 6 below) are used, etc. The area of land-based hatcheries and nurseries 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 7.2.37 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 7.1 in Chapter 7) 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 5).

3. 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 7.1 in Chapter 7) 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 5).

1003 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

4. 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.

5. 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.

6. 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.

7. 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. 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.

1004 TYPE OF WATER (for the holding)

- *Freshwater*
- *Brackish water*
- *Saltwater*

Reference period: census reference year

9. 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 additional Item 1002.

10. 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.

1005 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

11. 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 additional Item 1002. Countries may wish to adapt these categories to suit local conditions.

1006 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 year

12. 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".

13. The main types of freshwater fish are carps, catfish, and tilapias. Diadromous fish are fish that can live in both fresh and marine water, such as trout, salmon, eels and sturgeon. Marine fish include groupers, seabream, flatfish, and tuna. Crustaceans are aquatic animals with hard shells, such as crabs, crayfish, lobsters, shrimps, and prawns. 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, sea cucumber, and sea urchins. Aquatic plants include seaweed and algae.

Theme 11: Forestry

1101 PRESENCE OF WOODLAND ON THE HOLDING

Reference period: census reference day.

1. Holdings with wooded areas can be identified through Item 0203 "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 7.2.30 -7.2.31 for the definition of this land use category), then the holding (an agricultural holding with presence of woodland) contains some wooded areas. However, this may not be sufficient for identifying all holdings with wooded areas without regard to title or legal form potentially usable for forestry activities or other purposes.

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.

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 7.1, see also paragraph 7.2.36).

4. Because of the above considerations, the concept of woodland is used 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 7.2.30) 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 without regard to title or legal form[21]. The reference period is the *census reference day*. Countries wishing to set up a list frame of holdings with woodland may collect this item in the census by complete enumeration to provide a frame for census supplementary forestry module and relevant sample surveys (see paragraph 3.47 and

[21] Thus, woodland owned by household members but rented to others should not be considered as presence of woodland in the holding. Conversely, woodland not owned by members of a household but rented from others for forestry production, resource protection, improving agricultural production, social and cultural values, recreation, ecotourism or other purposes should be considered.

3.49 for the scope of a forestry module).

1102 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: census reference day.

5. This item collects data on the total area of woodland on the holding as defined in paragraph 4 above, 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 essential Item 0203 (see paragraph 7.2.30). 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 7.2.30), 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 7.2.37). Subitem e. covers those areas that span less than 0.5 and satisfy all other criteria for either forest land or other wooded land.

1103 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

6. This item relates to all woodland on the holding, including all categories listed in additional Item 1103. Purposes are assessed with respect to an extended period, usually the census reference year.

7. *Production* refers to the production and extraction of forest goods, including both wood (timber, fuelwood, wood chips) and non-wood (wild-growing mushrooms, berries and nuts, oils, leaves, bark) forest products.

8. *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.

9. *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 topsoil 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.

10. *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.

11. 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. Other includes woodland with no specific function.

1104 WHETHER FORESTRY ACTIVITIES ARE PRACTISED (for the holding)

- Logging
- Afforestation (planting trees)
- Reforestation (replanting trees)
- Nursery (cultivating seedlings for afforestation or reforestation)
- Extraction of fuelwood and production of charcoal
- Gathering of plant-based edible and non-edible wild non-wood products
- Gathering of animal-based edible and non-edible wild non-wood products

Reference period: the census reference year

12. The purpose of this new item is determining any forestry activities practised in the woodland, including silviculture (e.g. timber production) and other activities such as nurseries, production of charcoal, and gathering of non-wood forest products. These activities are also own-account activities in the woodland and do not include paid or unpaid work for a unit not associated with the holding.

1105 WHETHER AGROFORESTRY IS PRACTISED (for the holding)

Reference period: the census reference year

13. 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.

14. 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. Countries wishing to set up a list frame of holdings practicing agroforestry may collect this item in the census by complete enumeration to support the design of specific sample surveys on this type of holding.

Theme 12: Fisheries

1201 ENGAGEMENT OF HOUSEHOLD MEMBERS IN FISHING ACTIVITY

- *in the household*
- *in other economic units*

Reference period: census reference year

1. A household member is a person forming part of the household. The definition of the household is given in paragraph 4.5.

2. 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. Countries wishing to set up a list frame of holdings engaged in fishing activities may collect this item in the census by complete enumeration to provide a frame for census supplementary modules and relevant sample surveys.

3. The item does not cover households with members engaged only in the processing of products

from fisheries (defined under ISIC Rev.5 class 1020) or only in trading of products from fishing. Trading refers to exchange of products in kind (including barter) or for monetary payment.

4. Capture fisheries fall under group 031 of ISIC (Rev. 5) 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.5), 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 10: Aquaculture.

5. 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, coastal waters or inland waters, in support of it.

1202 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

6. 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.

7. 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. 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.

9. Data regarding sex are important to capture accurate information on the activities of women in fishing.

1203 NUMBER OF FISHERS EMPLOYED BY THE HOUSEHOLD BY SEX

Reference period: census reference year

10. 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. Data regarding sex are important to capture information on the activities of women in fishing. 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 additional item 1202 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 above).

1204 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

11. This item refers to access arrangements for individuals to utilize aquatic resources for the purpose of fishing. Access arrangements include formal (such as licenses) 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.

12. 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.

1205 MAIN PURPOSE OF HOUSEHOLD FISHING ACTIVITY

- *Producing mainly for own consumption*
- *Producing mainly for sale*

Reference period: census reference year

13. 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.

14. 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.

1206 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

15. This item refers to the use of a vessel for fishing. Source refers to owned vessels or lent from others. 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.

1207 TYPE OF FISHING GEAR USED

Reference period: census reference year

16. 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, 2016), 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
- Miscellaneous gear (including gathering by hand with simple hand implements)

17. Detailed descriptions of gear under each category are available in the Classification and illustrated definition of fishing gears (FAO, 2021b). 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.

ANNEX 5

Correspondence between WCA 2030, FAO and SEEA land use classes

<table>
<tr><th>WCA 2030 main land use classes</th><th>FAO land use classes</th><th colspan="3">SEEA 2012 land use classification</th></tr>
<tr><td>LU1. Land under temporary crops</td><td>6630. Temporary crops</td><td rowspan="6">1.1 Agriculture</td><td colspan="2">1.1.1 Land under temporary crops</td></tr>
<tr><td>LU2. Land under temporary meadows and pastures</td><td>6633. Temporary meadows and pastures</td><td colspan="2">1.1.2 Land under temporary meadows and pastures</td></tr>
<tr><td>LU3. Land temporarily fallow</td><td>6640. Temporary fallow</td><td colspan="2">1.1.3 Land with temporary fallow</td></tr>
<tr><td>LU4. Land under permanent crops</td><td>6650. Permanent crops</td><td colspan="2">1.1.4 Land under permanent crops</td></tr>
<tr><td rowspan="2">LU5. Land under permanent meadows and pastures</td><td rowspan="2">6655. Permanent meadows and pastures</td><td rowspan="2">1.1.5 Land under permanent meadows and pastures</td><td>1.1.5.1 Cultivated</td></tr>
<tr><td>1.1.5.2 Naturally grown</td></tr>
<tr><td>LU6. Land under farm buildings and farmyards</td><td>6649. Farm buildings and farmyards</td><td colspan="2">1.1.6 Land under protective cover</td></tr>
<tr><td rowspan="2">LU7. Forest and other wooded land</td><td>6646. Forest land*</td><td>1.2 Forestry</td><td colspan="2">1.2.1 Forest land</td></tr>
<tr><td>6670. Other land**</td><td>1.2 Forestry</td><td colspan="2">1.2.2 Other wooded land</td></tr>
<tr><td rowspan="3">LU8. Area used for aquaculture (including inland and coastal waters if part of the holding)</td><td>6670. Other land**</td><td colspan="3">1.3 Land used for aquaculture</td></tr>
<tr><td>6680. Inland waters</td><td colspan="3">2.1 Inland waters used for aquaculture or holding facilities</td></tr>
<tr><td>6773. Coastal waters</td><td colspan="3">3.1 Coastal waters used for aquaculture or holding facilities</td></tr>
<tr><td rowspan="12">LU9. Other area not elsewhere classified</td><td rowspan="5">6670. Other land**</td><td colspan="3">1.4 Use of built-up and related areas</td></tr>
<tr><td colspan="3">1.5 Land used for maintenance and restoration of environmental functions</td></tr>
<tr><td colspan="3">1.6 Other uses of land, n.e.c.</td></tr>
<tr><td colspan="3">1.7 Land not in use</td></tr>
<tr><td rowspan="3">6680. Inland waters</td><td colspan="3">2.2 Inland waters used for maintenance and restoration of environmental functions</td></tr>
<tr><td colspan="3">2.3 Other uses of inland waters, n.e.c.</td></tr>
<tr><td colspan="3">2.4 Inland waters not in use</td></tr>
<tr><td rowspan="3">6773. Coastal waters</td><td colspan="3">3.2 Coastal waters used for maintenance and restoration of environmental functions</td></tr>
<tr><td colspan="3">3.3 Other uses of coastal waters, n.e.c.</td></tr>
<tr><td colspan="3">3.4 Coastal waters not in use</td></tr>
</table>

* “6646. Forest land” excludes “other wooded land”.
** “6670. Other land” includes “other wooded land”.

ANNEX 6

Classification of crops

The Indicative Crop Classification (ICC 1.1) developed in the WCA 2020 round, has been revised for the 2030 round of agricultural censuses, and is given at the end of this annex as Version 1.2.

The ICC used in the 2020 agricultural census programme reflected various elements related to crops, including the growing cycle (temporary/permanent), crop genus or species (each crop can be described by its botanical name) and product type (provided in the structure of Central Product Classification Version 3).

ICC has been revised based on the Central Product Classification (CPC) Version 3 (UN, 2025b). 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.

ICC Version 1.2 is based on the new revised CPC Version 3, to which FAO has provided input. ICC Version1.2 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 1.2, 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 1.2, 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 1.2:

- 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 7.

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 1.2 (ICC)

Group	Class	Sub class	Order	Descriptor	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
		2.04.01		Mushrooms	T
		2.04.02		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
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

Group	Class	Sub class	Order	Descriptor		Crop type*
		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
		3.05.04			*Peaches and nectarines*	P
		3.05.05			*Pears and quinces*	P
		3.05.06			*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
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

Group	Class	Sub class	Order	Descriptor	Crop type*
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
			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
			9.02.01.03	Flax	T
			9.02.01.04	Hemp	T
			9.02.01.90	Other temporary fibre crops, n.e.c.	T
		9.02.02		*Permanent fibre crops*	P

Group	Class	Sub class	Order	Descriptor	Crop type*
			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*	T
		9.03.02		*Permanent medicinal, pesticidal or similar crops*	P
			9.03.02.01	*Ginseng*	P
			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*	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 7

Alphabetic list of crops with botanical name and crop code (ICC and CPC)

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Abaca (Manila hemp)	*Musa textilis*	9.02.01.04	9.02.01.04	01929.07
Alfalfa for fodder or seed	*Medicago sativa*	9.01.01	9.01.01	01912*
Almond	*Prunus dulcis*	3.06.01	3.06.01	01371
Angelica stems	*Angelica archangelica*	6.02.02.90	6.02.02.90	01699*
Anise seeds	*Pimpinella anisum*	6.02.01.02	6.02.01.02	01654*
Apple	*Malus sylvestris*	3.05.01	3.05.01	01341
Apricot	*Prunus armeniaca*	3.05.02	3.05.02	01343
Areca (betel nut)	*Areca catechu*	3.06.08	3.06.08	01379.01
Arracha	*Arracacia xanthorrhiza*	5.9	5.9	01599*
Arrowroot	*Maranta arundinacea*	5.9	5.9	01599*
Artichoke	*Cynara scolymus*	2.01.01	2.01.01	01216
Asparagus	*Asparagus officinalis*	2.01.02	2.01.02	01211
Avocado	*Persea americana*	3.01.01	3.01.01	01311
Bajra (Pearl millet)	*Pennisetum americanum*	1.08	1.08	01181*, 01182*
Bambara bean	*Voandzeia subterranea or Vigna subterranea*	7.09	7.09	01708
Banana	*Musa sapientum, M. cavendishii, M.nana*	3.01.02	3.01.02	01312.01, 01312.02
Barley	*Hordeum vulgare*	1.05	1.05	01151, 01152
Bay leaves	*Laurus nobilis,*	6.02.02.90	6.02.02.90	01699*
Basil	*Ocimum basilicum*	9.03.01.02	9.03.01.02	01930.90*
Beans	*Phaseolus vulgaris*	7.01	7.01	01701*, 01241.01*,01241.90*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Beet, fodder (mangel) red, sugar, sugar for fodder, sugar for seeds	*Beta vulgaris*	8.01	8.01	01919.90* (fodder), 01259* (red), 01801 (sugar), 01803 (sugar for seeds)
Bergamot	*Citrus bergamia*	3.02.90	3.02.90	01329
Betel nut	*Areca catechu*	3.06.08	3.06.08	
Black pepper	*Piper nigrum*	6.02.02.01	6.02.02.01	01651
Blackberries of various species	*Rubus spp.*	3.04.90	3.04.90	01353.02*
Blueberry	*Vaccinium myrtillus; V. corymbosum*	3.04.06	3.04.06	01355.01
Brazil nut	*Bertholletia excelsa*	3.06.07	3.06.07	01377
Breadfruit	*Artocarpus altilis*	3.01.90	3.01.90	01319*
Broad bean,	*Vicia faba*	7.02	7.02	01702*, 01243*
Broccoli	*Brassica oleracea var. botrytis*	2.01.04	2.01.04	01213
Broomcorn millet	*Panicum miliaceum*	1.08	1.08	01181*, 01182*
Broom sorghum	*Sorghum bicolor*	1.04	1.04	01141*, 01142*, 01919.01*
Brussels sprouts	*Brassica oleracea var. gemmifera*	2.01.90	2.01.90	01212*
Buckwheat	*Fagopyrum esculentum*	1.1	1.1	01192
Cabbage (red, white, Savoy)	*Brassica oleracea var. capitata*	2.01.03	2.01.03	01212*, 01919.90* (fodder)
Cabbage, Chinese	*Brassica chinensis*	2.01.03	2.01.03	01212*
Cacao (cocoa)	*Theobroma cacao*	6.01.04	6.01.04	01640
Cantaloupe	*Cucumis melo*	2.05.02	2.05.02	01229
Caraway seeds	*Carum carvi*	6.02.01.90	6.02.01.90	01654*
Cardamom	*Elettaria cardamomum*	6.02.02.02	6.02.02.02	01653*
Cardoon	*Cynara cardunculus*	2.01.90	2.01.90	01219.90*
Carob	*Ceratonia siliqua*	3.9	3.9	01356

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Carrot	*Daucus carota ssp. sativa*	2.03.01	2.03.01	01251* (edible), 01919.90* (fodder)
Cashew nuts	*Anacardium occidentale*	3.06.02	3.06.02	01372
Cassava (manioc)	*Manihot esculenta*	5.03	5.03	01520.01*, 01520.02*, 01219.01*
Castor bean	*Ricinus communis*	4.03.01	4.03.01	01447
Cauliflower	*Brassica oleracea var. botrytis*	2.01.04	2.01.04	01213
Celeriac	*Apium graveolens var. rapaceum*	2.03.90	2.03.90	01259* '
Celery	*Apium graveolens*	2.01.90	2.01.90	01290.90*
Chayote	*Sechium edule*	2.02.90	2.02.90	01239.90*
Cherry	*Prunus avium, cerasus avium*	3.05.03	3.05.03	01344.02
Chestnut	*Castanea sativa*	3.06.03	3.06.03	01373
Chickpea (gram pea)	*Cicer arietinum*	7.03	7.03	01703
Chicory	*Cichorium intybus*	2.01.07	2.01.07	01214*, 01691*
Chili (all varieties)	*Capsicum spp. (annuum)*	6.02.01.01	6.02.01.01	01652*, 01231*
Cinnamon	*Cinnamomum verum*	6.02.02.03	6.02.02.03	01655
Citron	*Citrus medica*	3.02.90	3.02.90	01329
Citronella	*Cymbopogon citrates/ Cymbopogon nardus*	9.02.02.90	9.02.02.90	01699*, 01930.90*
Clementine	*Citrus reticulata*	3.02.04	3.02.04	01324.02*
Clove	*Eugenia aromatica (Syzygium aromaticum)*	6.02.02.04	6.02.02.04	01656
Clover for fodder (all varieties)	*Trifolium spp.*	9.01.01	9.01.01	01919.03*
Coca	*Erythroxypum novogranatense, E. coca*	9.03.02.02	9.03.02.02	01990*
Cocoa (cacao)	*Theobroma cacao*	6.01.04	6.01.04	01640
Coconut	*Cocos nucifera*	4.04.01	4.04.01	01460
Cocoyam	*Colocasia esculenta*	5.9	5.9	01599*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Coffee	*Coffea spp.*	6.01.01	6.01.01	01610
Cola nut (all varieties)	*Cola acuminata; C. nitida; C.vera*	3.06.09	3.06.09	01379.02
Colza (rapeseed)	*Brassica napus*	4.03.05	4.03.05	01443
Corn (see maize)				
Corn salad (mâché/lamb's lettuce)	*Valerianella locusta*	2.01.90	2.01.90	01219.90*
Cotton (all varieties)	*Gossypium spp.*	9.02.01.01	9.02.01.01	01921.01, 01921.02
Cottonseed (all varieties)	*Gossypium spp.*	9.02.01.01	9.02.01.01	01431, '01432,'01921.01
Cowpea, for grain or harvested green	*Vigna unguiculata*	7.04	7.04	01706*
Cranberry	*Vaccinium macrocarpon; V. oxycoccus*	3.04.07	3.04.07	01355.02
Cress	*Lepidium sativum*	2.01.90	2.01.90	01219.90*
Cucumber	*Cucumis sativus*	2.02.01	2.02.01	01232
Currants (all varieties)	*Ribes spp.*	3.04.01	3.04.01	01351.01
Custard apple	*Annona reticulate*	3.01.90	3.01.90	01319*
Dasheen	*Colocasia esculenta*	5.9	5.9	01599*
Date	*Phoenix dactylifera*	3.01.04	3.01.04	01314
Dill and dill seed	*Anethum graveoles*	6.02.02.90	6.02.02.90	01699*
Drumstick tree	*Moringa oleifera*	6.02.02.90	6.02.02.90	01699*
Durra (sorghum)	*Sorghum bicolour*	1.04	1.04	01141*, 01142*, 01919.01*
Durum wheat	*Triticum durum*	1.01	1.01	01111*, 01112*
Earth pea	*Vigna subterranea*	7.9	7.9	01709.90*,01249*
Edo (eddoe)	*Xanthosoma spp.; Colocasia spp.*	5.9	5.9	01599*
Eggplant	*Solanum melongena*	2.02.02	2.02.02	01233
Endive	*Cichorium endivia*	2.01.90	2.01.90	01214*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Fennel	*Foeniculum vulgare*	6.02.01.02	6.02.01.02	01654*
Fenugreek	*Trigonella foenum-graecum*	7.9	7.9	01699*
Fig	*Ficus carica*	3.01.05	3.01.05	01315
Filbert (hazelnut)	*Corylus avellana*	3.06.04	3.06.04	01374
Fique	*Furcraea macrophylla*	9.02.01.90	9.02.01.90	01929.90*
Flax for fibre	*Linum usitatissimum*	9.02.01.03	9.02.01.03	01929.01*
Fonio	*Digitaria exilis; D. iburua*	1.11	1.11	01193
Formio (New Zealand flax)	*Phormium tenax*	9.02.01.03	9.02.01.03	01929.90*
Garlic	*Allium sativum*	2.03.03	2.03.03	01252*
Geranium	*Pelargonium spp.; Geranium spp.*	9.03.01	9.03.01	01930.90*
Ginger	*Zingiber officinale*	6.02.02.05	6.02.02.05	01657
Ginseng	*Panax spp.*	9.03.02.01	9.03.02.01	01930.90*
Gooseberry (all varieties)	*Ribes spp.*	3.04.02	3.04.02	01351.02
Gourd	*Lagenaria spp; Cucurbita spp.*	2.02.04	2.02.04	01235
Gram pea (chickpea)	*Cicer arietinum*	7.03	7.03	01703
Grape	*Vitis vinifera*	3.03	3.03	01330*
Grapefruit	*Citrus paradisi*	3.02.01	3.02.01	01321
Grass esparto	*Lygeum spartum*	9.90.01	9.90.01	01929.90*
Grass, orchard	*Dactylis glomerata*	9.01.01	9.01.01	01919.90*
Grass, Sudan	*Sorghum bicolour var. Sudanense*	9.01.01	9.01.01	01919.90*
Groundnut (peanut)	*Arachis hypogaea*	4.02	4.02	01421*, 01422*
Guarana	*Paulinia cupana*	9.03.02.04	9.03.02.04	01930.90*
Guava	*Psidium guajava*	3.01.06	3.01.06	01316.02
Guinea corn (sorghum)	*Sorghum bicolor*	1.04	1.04	01141*, 01142*, 01919.01*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Guinea pepper	*Afframomum melegueta, piper guineense, xylopia aethiopica)*	6.02.02.90	6.02.02.90	01653*
Hazelnut (filbert)	*Corylus avellana*	3.06.04	3.06.04	01374
Hemp fibre	*Cannabis sativa ssp. Indica*	9.02.01.04	9.02.01.04	01929.02
Hemp, Manila (abaca)	*Musa textilis*	9.02.01.04	9.02.01.04	01929.07
Hemp, sun	*Crotalaria juncea*	9.02.01.04	9.02.01.04	01922.02*
Hempseed	*Cannabis sativa (marijuana)*	4.03.90	4.03.90	1449.02
Henequen	*Agave fourcroydes*	9.02.02.90	9.02.02.90	01929.06*
Henna	*Lawsonia inermis*	9.01.01	9.01.01	01912, 01919.03, 01919.90*
Hop	*Humulus lupulus*	6.02.02.07	6.02.02.07	01659
Horse bean	*Vicia faba*	7.02	7.02	01702*, 01243*
Horseradish	*Armoracia rusticana*	2.03.90	2.03.90	01259*
Hybrid maize	*Zea mays*	1.02	1.02	01121*, 01122*, 01911, 01290.01*
Indigo	*Indigofera tinctoria*	9.90.01	9.90.01	01930.90*, 01990*
Jasmine	*Jasminum spp.*	9.05.02	9.05.02	01930.90*
Jerusalem artichoke	*Helianthus tuberosus*	2.01.01	2.01.01	01599*
Jojoba	*Simmondsia californica or S. chinensis*	4.03.11	4.03.11	01499.03
Jowar (sorghum)	*Sorghum bicolor*	1.04	1.04	01141*, 01142*, 01919.01*
Jute	*Corchorus spp.* (over 30 sp.)	9.02.01.02	9.02.01.02	01922.01*
Kale	*Brassica oleracea var. Acephala*	2.01.90	2.01.90	01219.90*, 01919.90*
Kapok	*Ceiba pentandra*	9.02.02	9.02.02	01499.05, 01929.03
Kava	*Piper methysticum*	9.03.02.03	9.03.02.03	01930.90*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Kenaf	*Hibiscus cannabinus*	9.02.01.02	9.02.01.02	01922.02*
Kiwi fruit	*Actinidia deliciosa*	3.04.03	3.04.03	01352
Kohlrabi	*Brassica oleracea var. gongylodes*	2.03.90	2.03.90	01219.90*, 01919.90*
Kola nut	*see* Cola nut	3.06.09	3.06.09	01379.02
Lavender	*Lavandula spp.* (over 15 sp.)	9.03.01	9.03.01	01930.90*
Leek	*Allium ampeloprasum; Allium porrum*	2.03.05	2.03.05	01254
Lemon	*Citrus limon*	3.02.02	3.02.02	01322*
Lemon grass	*Cymbopogon citratus*	9.02.02.90	9.02.02.90	01699*, 01930.90*
Lentil	*Lens culinaris*	7.05	7.05	01704
Lespedeza (all varieties)	*Lespedeza spp.*	9.01.01	9.01.01	01919.90*
Lettuce	*Lactuca sativa var. capitata*	2.01.05	2.01.05	01214*
Lime, sour	*Citrus aurantifolia*	3.02.02	3.02.02	01322*
Lime, sweet	*Citrus limetta*	3.02.02	3.02.02	01322*
Linseed (flax for oil seed)	*Linum usitatissimum*	4.03.02	4.03.02	01441
Liquorice	*Glycyrrhiza glabra*	9.03.01	9.03.01	01930.90*
Litchi	*Litchi chinensis*	3.01.90	3.01.90	01319*
Loquat	*Eriobotrya japonica*	3.05.90	3.05.90	01349.10, 01349.20
Lupine (all varieties)	*Lupinus spp.*	7.06	7.06	01709.02
Macadamia (Queensland nut)	*Macadamia spp. ternifolia*	3.06.90	3.06.90	01379.03
Mace	*Myristica fragrans*	6.02.02.02	6.02.02.02	01653*
Maguey	*Agave atrovirens*	9.02.02	9.02.02	01929.06*
Maize (corn), ordinary, hybrid	*Zea mays*	1.02	1.02	01121*, 01122*, 01290.01*, 01911* (silage)

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Mandarin	*Citrus reticulata*	3.02.04	3.02.04	01324.01*
Mangel (fodder beet)	*Beta vulgaris*	8.01	8.01	01919.90*
Mango	*Mangifera indica*	3.01.06	3.01.06	01316.01
Mangosteen/Mangostano	*Garcinia mangostana*	3.01.06	3.01.06	01316.03
Manioc (cassava)	*Manihot esculenta*	5.03	5.03	01520.01*, 01520.02*, 01219.01*
Maslin (mixed cereals)	*Mixture of Triticum spp.; Secale cereale*	1.14	1.14	01199.02
Medlar	*Mespilus germanica*	3.05.90	3.05.90	01349.20
Melon (except watermelon)	*Cucumis melo*	2.05.02	2.05.02	01229, 01449.01
Millet, bajra, bulrush or pearl	*Pennisetum americanum*	1.08	1.08	01181*, 01182*
Millet, finger	*Eleusine coracana*	1.08	1.08	01181*, 01182*
Millet, foxtail	*Setaria italica*	1.08	1.08	01181*, 01182*
Millet, Japanese	*Echinochloa esculenta*	1.08	1.08	01181*, 01182*
Millet, common, proso	*Panicum miliaceum*	1.08	1.08	01181*, 01182*
Mint (all varieties)	*Mentha spp.*	9.03.01.01	9.03.01.01	01930.01
Mulberry for fruit (all varieties) or for silkworms	*Morus spp.*	3.9	3.9	01353.02*
Mushrooms	*Agaricus spp. ; Pleurotus spp ; Volvariella*	2.04	2.04.01	01271
Mustard	*Brassica nigra; Sinapis alba*	4.03.03	4.03.03	01442
Nectarine	*Prunus persica var. nectarina*	3.05.04	3.05.04	01345*
New Zealand flax (formio)	*Phormium tenax*	9.02.01.03	9.02.01.03	01929.90*
Niger seed	*Guizotia abyssinica*	4.03.04	4.03.04	01449.90*
Nutmeg	*Myristica fragrans*	6.02.02.02	6.02.02.02	01653*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Oats, for grain or fodder	*Avena spp.* (about 30 sp.)	1.07	1.07	01171, 01172, 01919.90* (for fodder)
Oil palm	*Elaeis guineensis*	4.04.03	4.04.03	01491.01, 01491.02
Okra	*Abelmoschus esculentus; Hibiscus esculentus*	2.02.05	2.02.05	01239.01
Olive	*Olea europaea*	4.04.02	4.04.02	01450
Onion	*Allium cepa*	2.03.04	2.03.04	01253.01
Opium	*Papaver somniferum*	9.03.01	9.03.01	01448
Orange	*Citrus sinensis*	3.02.03	3.02.03	01323*
Orange, bitter	*Citrus aurantium*	3.02.03	3.02.03	01323*
Ornamental plants	Various	9.05.01	9.05.01	01961*, 01962*
Palm palmyra	*Borassus flabellifer*	9.09.02	9.09.02	01929.90*, 01809*
Palm, (kernel) oil	*Elaeis guineensis*	4.04.03	4.04.03	'01491.02
Palm, sago	*Metroxylon sagu*	9.09.02	9.09.02	01599*
Papaya (pawpaw)	*Carica papaya*	3.01.07	3.01.07	01317
Parsnip	*Pastinaca sativa*	2.03.90	2.03.90	01259*
Pea	*Pisum sativum*	7.07	7.07	01705 (dry), 01241 (green)
Peach	*Prunus persica*	3.05.04	3.05.04	01345*
Peanut (groundnut)	*Arachis hypogaea*	4.02	4.02	01421*, 01422*
Pear	*Pyrus communis*	3.05.05	3.05.05	01342.01
Pecan nut	*Carya illinoensis*	3.06.90	3.06.90	01379.90*
Pepper, black	*Piper nigrum*	6.02.02.01	6.02.02.01	01651
Pepper	*Capsicum spp.* (over 30 sp.)	6.02.01.01	6.02.01.01	01652
Pepper, sweet	*Capsicum annuum*	6.02.02.01	6.02.02.01	01231*, 01652*
Persimmon	*Diospyros kaki; Diospyros virginiana*	3.01.90	3.01.90	01359.01
Pigeon pea	*Cajanus cajan*	7.08	7.08	01707

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Pineapple	*Ananas comosus*	3.01.08	3.01.08	01318
Pistachio nut	*Pistacia vera*	3.06.05	3.06.05	01375
Plantain	*Musa paradisiaca*	3.01.03	3.01.03	01313.01, 01313.02
Plum	*Prunus domestica*	3.05.06	3.05.06	01346
Pomegranate	*Punica granatum*	3.9	3.9	01359.90*
Pomelo	*Citrus grandis*	3.02.01	3.02.01	01321
Poppy seed	*Papaver somniferum*	4.03.12	4.03.12	01448
Poppy straw	*Papaver somniferum*	9.03.01.90	9.03.01.90	01930.90* 03249
Potato	*Solamum tuberosum*	5.01	5.01	01510
Potato, sweet	*Ipomoea batatas*	5.02	5.02	01530*
Prune	*Prunus domestica*	3.05.06	3.05.06	01346
Pumpkin	*Cucurbita spp.* (over 25 sp.)	2.02.04	2.02.04	01235 (edible), 01919.90* (fodder)
Pyrethrum	*Chrysanthemum cinerariaefolium*	9.90.01	9.90.01	01930.02, 01930.03,
Queensland nut	See Macadamia	3.06.90	3.06.90	01379.90*
Quince	*Cydonia oblonga*	3.05.05	3.05.05	01342.02
Quinine	*Cinchona spp.* (more than 6 sp.)	9.03.02	9.03.02	01930.90*
Quinoa	*Chenopodium quinoa*	1.12	1.12	01194
Radish	*Raphanus sativus (inc. Cochlearia armoracia)*	2.03.90	2.03.90	01259*
Ramie	*Boehmeria nivea*	9.02.02.01	9.02.02.01	01929.04*
Rapeseed (colza)	*Brassica napus*	4.03.05	4.03.05	01443
Raspberry (all varieties)	*Rubus spp.* (over 360 sp.)	3.04.04	3.04.04	01353.01
Red beet (see Beet, red)				
Redtop	*Agrostis spp.*	9.01.01	9.01.01	01919.90*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Rhea	*Boehmeria nivea*	9.02.02	9.02.02	01929.04*
Rhubarb	*Rheum spp.*	2.01.90	2.01.90	01219.90*
Rice	*Oryza sativa; Oryza glaberrima*	1.03	1.03	01131, 01132
Rose	*Rose spp.*	9.05.02	9.05.02	01961.01*, 01962.02*
Rubber	*Hevea brasiliensis*	9.04	9.04	01950.01, 01950.02
Rutabaga (swede)	*Brassica napus var. napobrassica*	2.03.90	2.03.90	01259*, 01919.90*
Rye	*Secale cereale*	1.06	1.06	01161, 01162
Ryegrass seed	*Lolium spp.* (about 20 sp.)	9.90.01	9.90.01	01919.02
Safflower	*Carthamus tinctorius*	4.03.06	4.03.06	01446
Saffron	*Crocus savitus*	6.02.02.90	6.02.02.90	01699*
Sainfoin	*Onobrychis viciifolia*	9.01.01	9.01.01	01919.90*
Salsify	*Tragopogon porrifolius*	2.03.90	2.03.90	01259*
Sapodilla	*Achras sapota*	3.9	3.9	01319
Satsuma	*Citrus unshiu*	3.02.04	3.02.04	01329
Scorzonera (black salsify)	*Scorzonera hispanica*	2.03.90	2.03.90	01259*
Sesame	*Sesamum indicum*	4.03.07	4.03.07	01444
Shea tree (shea butter or karite nut)	*Vitellaria paradoxa* or *Butyrospermum parkii*	4.03.09	4.03.09	01499.01
Sisal	*Agave sisalana*	9.02.02.02	9.02.02.02	01929.05
Sorghum, broom, durra, guinea corn or jowar	*Sorghum bicolor*	1.04	1.04	01141*, 01142*, 01919.01*
Sorghum, sweet	*Sorghum bicolor*	8.03	8.03	01919.01*
Sour cherry	*Prunus cerasus, cerasus acida*	3.05.03	3.05.03	01344.01
Soybean or soybean hay	*Glycine max*	4.01	4.01	01411*, 01412*
Spelt wheat	*Triticum spelta*	1.01	1.01	01111*, 01112*
Spinach	*Spinacia oleracea*	2.01.06	2.01.06	01215

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Squash	*Cucurbita spp.* (over 25 sp.)	2.02.04	2.02.04	01235
Strawberry	*Fragaria spp.* (over 30 sp.)	3.04.05	3.04.05	01354
Sugar beet (see Beet, sugar)				
Sugar cane for sugar, alcohol, thatching or fodder	*Saccharum officinarum*	8.02	8.02	01802*, 01919.90* (fodder)
Sunflower for fodder	*Helianthus annuus*	4.03.08	4.03.08	01919.90*
Sunflower for oil seed	*Helianthus annuus*	4.03.08	4.03.08	01445
Sunhemp	*Crotalaria juncea*	9.02.01.04	9.02.01.04	01922.02*
Swede	*Brassica napus var. napobrassica*	2.03.90	2.03.90	01259*
Swede for fodder	*Brassica napus var. napobrassica*	2.03.90	2.03.90	01919.90*
Sweet lime (see Lime, sweet)				
Sweet pepper (see Pepper, sweet)				
Sweet potato (see Potato, sweet)				
Sweet sorghum (see Sorghum, sweet)				
Tallow tree	*Shorea aptera; S. stenocarpa; Sapium sebiferum; Stillingia sebifera*	4.03.13	4.03.13	01499.04
Tangerine (see Mandarin)				
Tannia	*Xanthosoma sagittifolium*	5.9	5.9	01591*
Taro	*Colocasia esculenta*	5.05	5.05	01550
Tea	*Camellia sinensis*	6.01.02	6.01.02	01620.01, 01620.02, 01930.04
Teff	*Eragrostis abyssinica*	1.9	1.9	01199.01
Thymus	*Thymus vulgaris*	6.02.02.90	6.02.02.90	01699*
Timothy	*Phleum pratense*	9.01.01	9.01.01	01919.90*
Tobacco	*Nicotiana tabacum*	9.06	9.06	01970
Tomato	*Lycopersicon esculentum*	2.02.03	2.02.03	01234
Trefoil	*Lotus spp.* (about 100 sp.)	9.90.01	9.90.01	01919.90*

Crop name	Botanical name	ICC 1.1 Code	ICC 1.2 Code	CPC 3.0 Code (under development)
Triticale	Hybrid of *Triticum aestivum* and *Secale cereale*	1.09	1.09	01191
Truffles	*Genus tuber*		20.04.02	01272
Tung tree	*Aleurites spp.; Fordii*	4.03.10	4.03.10	01499.02
Turmeric	*Curcuma longa*	6.02.02.90	6.02.02.90	01699*
Turnip	*Brassica rapa*	2.03.02	2.03.02	01251* (edible), 01919.90* (fodder)
Urena (Congo jute)	*Urena lobata*	9.02.01.02	9.02.01.02	01922.02*
Vanilla	*Vanilla planifolia*	6.02.02.06	6.02.02.06	01658
Vetches	*Vicia sativa*	7.1	7.1	01709.01
Walnut	*Juglans spp.* (over 20 sp.), *ep. regia*	3.06.06	3.06.06	01376
Watermelon	*Citrullus lanatus*	2.05.01	2.05.01	01221
Wheat	*Triticum aestivum*	1.01	1.01	01111*, 01112*
Yam	*Dioscorea spp*. (over 120 sp.)	5.04	5.04	01540
Yautia	*Xanthosoma sagittifolium*	5.06	5.06	01591*
Yerba mate	*Ilex paraguariensis*	6.01.03	6.01.03	01630

The main objective of this annex is to provide guidance to countries to identify crops and the links with ICC and CPC 3.0

ICC 1.1 code refers to the crop codes used in the current WCA 2020.

ICC 1.2 code refers to the crop codes used in the current WCA 2030.

CPC 3.0 code refers to corresponding codes in Central Product Classification (CPC) Version **3.0**

*Indicates when more than one ICC code is linked to the same CPC code or when one ICC code is linked to more than one CPC code

ANNEX 8 Classification of livestock

Group	Class	Descriptor	Link to CPC Ver. 3.0
	1	**Bovine animals**	**0211**
1	11	Cattle	02111
	12	Buffaloes	02112
	19	Other bovine animals	02119
	2	**Sheep and goats**	**02122-02123**
2	21	Sheep	02122
	22	Goats	02123
3	3	**Swine/ pigs**	**02140**
	4	**Equines**	**02131-02133**
4	41	Horses	02131
	42	Asses	02132
	43	Mules and hinnies	02133
	5	**Camels and camelids**	**02121**
	51	Dromedary	02121*
5	52	Bactrian camel	02121*
	53	Llamas and alpacas	02121*
	59	Other camelids	02121*
	6	**Poultry**	**0215**
	61	Chickens	02151
6	62	Turkeys	02152
	63	Geese	02153
	64	Ducks	02154
	65	Guinea fowls	02155
	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*
7	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 9

Classification of machinery and equipment

Group	Class	Subclass	Descriptor	Types of machinery and equipment included	HS 2022 code
1			Manually-operated equipment	Seed/fertilizer drill	8432.31 8432.39
				Transplanter	8432.31 8432.39
				Thresher	8433.52
				Winnower	8437.10
				Sprayer	8424.41 8424.49
				Duster	8424.82
				Hand pump or other hand irrigation devices	8413.20
2			Animal-powered equipment	Wooden plough	8432.10
				Steel plough	8432.10
				Cultivator	8432.29
				Disk harrow	8432.21
				Seed/fertilizer drill	8432.3 (8432.31, 39)
				Leveller	8429.20
				Animal cart	8716.20
				Animal-operated irrigation devices	8424.49
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	8701.91 8701.92 8701.93 8701.94 8701.95
				Single-axle tractor	8701.10
				Bulldozer	8429.11
				Carryall	8709.11, 8709.19
				Truck	8704.10-.90
				Boat	8901.20-.90; 8902
				Other vehicle	8701.91 8701.92 8701.93 8701.94 8701.95
				Trailer	8716.20
	33		Crop machinery and equipment		
		331	*Land preparation*	Power tiller	8432.10
				Plough	8432.10

Group	Class	Subclass	Descriptor	Types of machinery and equipment included	HS 2022 code
			and planting machinery and equipment	Rotary tiller	8432.10
				Rotary harrow	8432.29
				Disk harrow	8432.21
				Grain drill	8432.80
				Broadcast seeder	8432.31 8432.39
				Seed/fertilizer drill	8432.31 8432.39
				Cultivator	8432.29
				Planters	8432.31 8432.39
				Levellers	8429.20
				Diggers	8429.51-.59
				Land plane	8432.80
				Transplanter	8432.31 8432.39
		332	*Crop maintenance machinery and equipment*	Manure spreader	8432.41 8432.42
				Fertilizer broadcaster	8432.41 8432.42
				Sprayer	8424.41 8424.49 8424.82
				Duster	8424.41 8424.49 8424.82
				Water pump	8424.41 8424.49 8424.82
				Drip irrigation	8424.41 8424.49 8424.82
				Sprinkler irrigation	8424.41 8424.49 8424.82
				Sprayers and other localized irrigation devices	8424.41 8424.49 8424.82
				Other irrigation equipment	8424.41 8424.49 8424.82
		333	*Crop harvesting machinery and equipment*	Mower for grass crops	8433.11; 8433.20
				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	8433.59
		334	*Post-harvest machinery and equipment*	Thresher	8433.52
				Grain cleaner	8437.10
				Sorters and graders	8437.10
				Other machinery	8437.80
	34		Livestock machinery and	Milking machine	8434.10
				Dairy machine	8434.20

Group	Class	Subclass	Descriptor	Types of machinery and equipment included	HS 2022 code
			equipment	Milk cooler	8419.89
				Cream separator	8421.11
				Incubator	8436.21
				Beekeeping machine	8436.80
	35		Aquacultural machinery and equipment		8902.00
	36		Forestry machinery and equipment		8436.80
	37		Unmanned Aerial vehicle and robots		8806.00

ANNEX 10

Overview of ILO Resolutions concerning statistics of work

The Resolution concerning statistics of work, employment and labour underutilization (ILO, 2013) adopted by the 19th International Conference of Labour Statisticians (ICLS) in 2013 and amended by the 21st ICLS in 2023 (ILO, 2023a) (below referred to as 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".

Work, as defined in the Resolution, can be performed in any type of economic unit as distinguished by the SNA 2008[22], 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.

The Resolution identifies five mutually exclusive subsets of work activities or forms of work, distinguishing them based on the intended destination of the production (for own final use or 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:

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

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 1 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 1 Conceptual framework for work statistics

<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="3">Forms of work</td><td colspan="2">Own-use production work</td><td rowspan="3">Employment (work for pay or profit)</td><td rowspan="3">Unpaid trainee work</td><td rowspan="3">Other work activities</td><td colspan="3">Volunteer work</td></tr>
<tr><td rowspan="2">of services</td><td rowspan="2">of goods</td><td rowspan="2">in market and non-market units</td><td colspan="2">in households producing</td></tr>
<tr><td>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.*
Source: ILO, 2023a

[22] The SNA 2025 was being developed at the time of preparation of the WCA 2030.

The resolution highlights subsistence foodstuff producers as an important subgroup of persons in own-use production work defined as all those who performed any of the activities related to the production and/or processing for storage agricultural, fishing, hunting and gathering products in order to produce foodstuff from agriculture, fishing, hunting or gathering that contribute to the livelihood of the household or family. It excludes persons engaged in such production as recreational or leisure activities.

It is very important to verify the subsistence nature of the activity for operational purposes, clarifying that it is carried out without workers hired for pay or profit. For purposes of monitoring conditions of labour market performance as related to insufficient access to, or integration in, markets, or to other factors of production, this group should be tabulated and reported separately to serve policy needs (see Chapter 9, Table 9.2 – cross-tabulation of item 0901 ''whether working on the holding is the main activity'' with the item 0110 ''main purpose of production'').

Operational definitions of relevant forms of work

One of the main features of the labour 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).

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.

This definition has important implications for defining employment for Theme 9 of the WCA 2030. 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.

Persons in own-use production work of goods, 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 the Theme 9 of the WCA 2030, 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.

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.

International Classification of Status in Employment

In October 2018, the 20th ICLS adopted the Resolution concerning statistics on work relationships to replace the ICSE-93 that had been adopted by the 15th ICLS in January 1993 (ILO, 1993). The resolution included a new international classification of status in employment (ICSE-18) as well as the broader international classification of status at work.

ICSE-18 comprises 10 categories of Status of Employment, in order to provide a more detailed and meaningful classification reflecting working relationships in the labour market:

(a) Dependent workers
- *Dependent contractors*
- *Employees*
  - *Permanent employees*
  - *Fixed-term employees*
  - *Short-term and casual employees*
  - *Paid apprentices, trainees and interns*
- *Contributing family workers*

(b) Independent Workers
- *Employers*
  - *Employers in corporations*
  - *Employers in household market enterprises*
- *Independent workers without employees*
  - *Owner-operators of corporations without employees*
  - *Own-account workers in household market enterprises without employees*

There are two types of jobs: dependent workers (i.e. jobs done by employees) and independent workers. Dependent workers are those, who employed for pay, on a formal or informal basis, who do not hold controlling ownership of the economic unit in which they are employed. In an independent work, the remuneration is directly dependent on the profits derived from the goods and services produced through market transactions.

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.

Permanent employees are employees who are guaranteed a minimum number of hours of work and are employed on an ongoing or indefinite basis. They are full-time or part-time workers employed for pay, in formal or informal jobs, who have employment arrangements whereby:

- There is no specified date or event on which employment in a particular economic unit will be terminated other than any age or time for retirement;
- The employer agrees to provide work and pay for a specified number of hours or to pay for the number of goods or services produced in a set period; and
- The worker agrees to work for at least the specified number of hours, or for the time required to produce a specified number of goods or services.

This group includes recently appointed employees with jobs that are subject to an initial trial period but are expected to continue indefinitely.

Fixed-term employees are employees who are guaranteed a minimum number of hours of work and are employed on a time-limited basis for a period of three months or more.

Short-term and casual employees are employees without a guaranteed minimum number of hours of work per pay period or with short-term employment arrangements for a period less than 3 months, irrespective of whether there is a guaranteed minimum number of hours of paid work or not.

Paid apprentices, trainees and interns are employees who perform any activity to produce goods or provide services for others, in order to acquire workplace experience or skills in a trade or profession and receive payment in return for work performed. Acquiring “workplace experience or skills” may occur through traditional, formal, or informal arrangements whether or not a specific qualification or certification is issued. They are usually remunerated at a reduced rate compared to fully qualified workers.

Dependent contractors is a new status in employment category, introduced with ICSE-18. They are

defined statistically as workers who have contractual arrangements of a commercial nature (but not a contract of employment) to provide goods or services for or through another economic unit, and satisfy the following conditions:

- they are not employees of that economic unit, but are dependent on that unit for organization and execution of the work, income, or for access to the market;
- they are workers employed for profit, who are dependent on another entity that exercises control over their productive activities and directly benefits from the work performed by them;
- the activity of the dependent contractor would potentially be at risk in the event of termination of the contractual relationship with that economic unit.

A *contributing family worker* is a person who holds a self-employment job in a market-oriented establishment operated by the family or 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 reconsidered.

Independent worker 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.

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.

Independent workers without employees operate an economic unit alone or in partnership with others, and do not employ any persons other than themselves, their partners, and contributing family workers to work in the economic unit on a regular basis as an employee.

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

ANNEX 11

SDG Indicators covered partially by Agricultural Censuses

As mentioned in the 2030 Agenda and the Sustainable Development Goals section (paragraphs 2.65 to 2.69), surveys are the preferred data source to regularly monitor progress in achieving the various SDG indicators. In the absence of periodic household surveys, a sample-based module in the agricultural census may provide partial data or coverage for Indicators 5.a.1, 2.3.1, and 2.3.2. Below is the list of WCA 2030 items related to each of the SDG indicators mentioned above.

Indicator 5.a.1: (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure

This indicator is part of SDG 5 which aims to achieve gender equality and empower all women and girls. The sub-indicator 5.a.1 (a) measures the prevalence of people in the agricultural population with ownership or tenure rights over agricultural land, disaggregated by sex. The sub-indicator 5.a.1 (b) measures the extent to which women are disadvantaged in ownership/tenure rights over agricultural land. More information can be found in FAO (2025b).

Agricultural land includes land under temporary crops, meadows, pastures, and fallow; and land under permanent crops; meadows, and pastures, following the classification of land use for the agricultural census recommended by WCA 2030 (see Figure 7.1 in Chapter 7).

The reference population is the agricultural population (i.e. adult population living in households operating agricultural holdings), not the total population. The reason is that tenure rights over agricultural land are relevant for individuals whose livelihood relies on agriculture.

Three proxies are identified to measure the concept ownership or tenure rights over agricultural land. Based on the recommendations from the Evidence and Data for Gender Equality (EDGE)[23] (UN, 2025c) project pilot tests (UN, 2019): (i) presence of a legally recognized document in the name of individual; (ii) right to sell; and (iii) right to bequeath. Owners or holders of land tenure rights over agricultural land are individuals who meet at least one of the three proxies. The EDGE pilots show that these three proxies offer the most robust measure of land tenure rights, ensuring comparability across countries with a diverse prevalence of legal documents. It should be noted that these proxies do not correspond to items of the WCA 2030. Only if the three proxies are included in the questionnaire, then the indicator could be computed.

Surveys are the preferred sources of data for this indicator due to their periodicity, but the agricultural census could serve as a viable alternative when agricultural or household surveys are unavailable by incorporating a sample module in the census questionnaire. The following table summarize the items needed to compute SDG indicator 5.a.1 and the related WCA 2030 items, some of which, items 0208, 0209, 0801 and 0802, are additional.

Table 1. List of elements of SDG indicator 5.a.1 and related WCA2030 items

Element	Related WCA 2030 items
Agricultural land	0203, 0208
Agricultural population	0106, 0801, 0802
Ownership or tenure rights over agricultural land	Partially 0204, 0209*

* WCA items 0204 and 0209 partially satisfy the measurement of the element “Ownership and tenure rights.” Using instead the three land tenure rights proxies mentioned above enables a better measurement of the element.

[23] The Evidence and Data for Gender Equality (EDGE) project is a joint initiative of the United Nations Statistics Division and UN Women that seeks to improve the integration of gender issues into the regular production of official statistics for better, evidence-based policies. For more information on EDGE project, please see https://unstats.un.org/edge.

Indicator 2.3.1: Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size

Indicator 2.3.2: Average income of small-scale food producers, by sex and indigenous status

These indicators measure the progress in achieving the Target 2.3, that is to double the agricultural productivity and incomes of small-scale food producers by 2030. In the case of the indicator 2.3.1, the classification of producers considers two categories: small-scale and large-scale food producers. Although the former is the principal category , the indicator for the latter is calculated and published as complementary series.

The small-scale food producer is defined using criteria of physical and economic size. The physical size comprises the area of operated land and the number of livestock heads in production. The economic size is expressed by its revenues. For each of the three size measures, a relative threshold is established as 40th percentile of its national cumulative distribution. Those producers below all three thresholds (i.e., operated land, livestock heads, and revenues) are defined as small-scale food producers. The large-scale food producers are defined as those producers which are above at least one of the three thresholds, that is, those producers not classified as small-scale food producers.

The indicator 2.3.1 focuses on labour productivity, where the labour input is measured by the number of labour days utilized by the food producer during a year (all forms of paid and unpaid labour). More information can be found in FAO (2025b).

Indicator 2.3.2 focuses on income from on-farm production activities including crop production, livestock production, fisheries and aquaculture production, and forestry production. These components refer to gross income, defined as revenues minus operating costs without considering the depreciation of assets. More information can be found in FAO (2025b).

Agricultural censuses do not collect information on agricultural production, income and detailed labour use. Several data sources need to be considered to collect data for the computation of both indicators. Agricultural surveys are the most appropriate data source for collecting information on the total volume of agricultural production, gross income, and labour input from agricultural holdings. Some of these surveys include the Agricultural Integrated Surveys (AGRISurvey; FAO, 2025a) and the Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA) promoted by the World Bank. However, the latter use the household and not the agricultural holdings, as a reference. Administrative data and registers constitute an alternative source of some data for computing both indicators, in countries with good coverage of agricultural holdings in those registers.

Despite all these recommendations, a small number of countries use agricultural censuses to calculate these indicators, incorporating sample modules in the questionnaires that allow data to be collected for their calculation. The following table summarizes the items needed to compute SDG indicators 2.3.1 and 2.3.2 and the related WCA 2030 items.

Table 2. List of elements of SDG indicators 2.3.1 and 2.3.2 and related WCA 2030 items

Element	Related WCA 2030 items
Operated land	0203
Number of livestock heads in production	0502
Economic size	Partially 0405, 0411, 0506, 0508, 0512, 1003, 1006, 1103, 1104, 1206, 1207*
Labour	Partially 0902, 0903*
Production costs	No items
Demographic information	0109, 0801

***** Agricultural censuses do not collect information on agricultural production, income and detailed labour use

GLOSSARY OF TERMS

Additional items: one of the two categories of census items which are provided for countries wishing to collect, preferably on a sample basis, more in-depth (supplementary) data on specific themes. They can be collected using either the classical or modular approach (paragraph 1.26). Some of these items can be used to provide sampling frames for census supplementary modules and relevant sample surveys.

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 4.20).

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 4.2 - 4.4).

Agricultural land: total of cropland and permanent meadows and pastures (paragraph 7.2.37).

Agriculture structure survey: a sample survey aimed to collect structural data on the entire country, or for substantial regions of it. (paragraph 5.6)

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, either concurrently or in rotation (paragraphs Annex 4, theme 11, paragraph 13).

Aquacultural census: collection of structural data from all aquacultural production units (paragraphs 3.30 - 3.32).

Aquacultural holding: economic unit of aquacultural production under single management comprising all aquaculture facilities without regard to title, legal form or size (paragraphs 3.33 – 3.35).

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 7.10.3 - 7.10.4).

Arable land: land used for cultivation of crops in rotation with fallow, meadows and pastures within cycles of up to five years. The total of areas under "Temporary crops," "Temporary meadows and pastures," and "Temporary fallow". (paragraph 7.2.37).

Archiving: a means of ensuring long-term preservation of data including ensuring its understandability by users (paragraph 10.29).

Associated crop: a temporary crop grown in a compact plantation of permanent crops (paragraph 7.4.13).

Biofertilizers: products containing living or dormant micro-organisms, such as bacteria and fungi, which provide nutrients to enhance plant growth (paragraph 7.4.27).

Biofuel: fuel, such as biogas or biodiesel, that is produced over a short time span from biomass, rather than by the very slow natural processes involved in the formation of fossil fuels. Biofuel can be produced from plants or from agricultural, domestic or industrial biowaste.

Census: statistical collection involving the enumeration of all units of a pre-defined population

Census classical approach: a census conducted as a single one-off operation in which all the census information is recorded (paragraphs 5.7 - 5.8).

Census core module: the primary agricultural census collection in the modular approach, carried out on a complete enumeration basis to provide key structural data and frames for supplementary module(s) (paragraphs 5.9 - 5.10).

Census coverage: set of agricultural producers of the country covered by census activities. Sometimes, countries omit certain areas of the country, such as urban areas, remote areas, areas with security problems or certain types of holdings (e.g., small subsistence holdings, holdings below cut-off thresholds) – for operational reasons (paragraph 4.28).

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) (paragraphs 5.9-5.12).

Census of agriculture and aquaculture: an agricultural census and an aquacultural census conducted as a combined field enumeration system (paragraph 3.30).

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 4.36).

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 non-inventory items (paragraph 4.36).

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 4.24).

Census supplementary module: sample-based module undertaken in the modular approach in association with the core census module to target specific populations and provide more in-depth data (paragraph 5.12).

Classification variables: characteristics used for the classification of data (paragraph 9.6).

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 (Annex 4, Theme 6, paragraph 40).

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 8.2).

Compact plantation: plants, trees and shrubs planted in a regular and systematic manner, such as in an orchard (or forming an irregular pattern, but densely enough to be considered an orchard), to which a specific area can be attributed (, Annex 4, Theme 4, paragraph 13).

Complete enumeration: collection of data from all units of the population, 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 (paragraph 7.4.29)**.**

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 5.41).

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 5.41).

Computer-Assisted Web-Interviewing (CAWI)**:** collects data using questionnaires placed on the Internet using secure methods and completed by a knowledgeable respondent (paragraph 5.42)

Conservation agriculture: combination of use of crop rotations, zero or no tillage, and presence of permanent soil cover (Annex 4, Theme 6, paragraph 27).

Crop rotation: technique of growing alternating species or families of crops in a specific field in a planned pattern or sequence (Annex 4, Theme 6, paragraph 30).

Cropland: total of arable land and land under permanent crops (paragraph 7.2.37).

Cross-tabulations: tables showing statistical data classified by two different items simultaneously (paragraph 9.7).

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 4.32).

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 (Annex 4, Theme 6, paragraph 48).

.**Drainage:** artificial removal of excess surface water or groundwater, together with dissolved substances, to enhance agricultural production (Annex 4, Theme 3, paragraph 23-24).

Educational attainment: highest grade of formal education completed or attended by a person (paragraph 7.1.18-7.1.19).

Employee: person who holds a paid employment job (Annex 10).

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 (Annex 10).

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 5.28).

Essential items: minimum set of structural items that all countries should collect, regardless of their approach to the agricultural census (paragraph 1.26). Some of these items can be used to provide sampling frames for census supplementary modules and relevant sample surveys.

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 7.4.23).

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 4.19).

Forest land: 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 7.2.30).

Frame: the basis used for identifying all the statistical units to be enumerated in a statistical collection.

Georeferencing: is the process of aligning satellite imagery or other types of maps with earth geographic coordinates to find the geographic position of a point on the earth's surface by longitude and latitude.

Global Positioning System (GPS)**:** system that makes it possible to georeference a point on the earth's surface by longitude and latitude. GPS allows the identification of the geographic coordinates for the holding or parcels and is used in some cases to measure areas. (paragraphs 5.51).

Gross area: area including uncultivated patches, bunds, foot paths, ditches, headlands, shoulders and shelter beds, used when dealing with land use (paragraph 7.2.20).

Hired manager: manager who is paid in cash, kind or both as distinguished from non-paid manager different from the holder (paragraphs 4.21, Annex 4, theme 1, paragraph 12).

Holder: see *agricultural holder*.

Holding: see *agricultural holding.*

Holdings in the household sector: holdings that are operated by household members (paragraph 4.4).

Holdings in the non-household sector: holdings that are in sectors other than the household sector, such as corporations and cooperatives (paragraph 4.4).

Household: arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living (paragraphs 4.5 - 4.6).

Inter-planted crops: crops planted between rows of another crop (paragraph 7.4.10).

Irrigation: action of purposely providing land with water, other than rain, for improving pastures or crop production (paragraphs 7.3.1 - 7.3.3).

Joint holder: person making the major decisions regarding resource use and exercising management control over the agricultural holding operations, in conjunction with one or more other persons (paragraph 4.21).

Land tenure: arrangements or rights under which the holder operates the land making up the holding (paragraphs 7.2.38 - 7.2.43).

Land under farm buildings and farmyards: Land used for agriculture occupied by dwellings on farms, etc.: dwellings, operating buildings (hangars, barns, cellars, greenhouses, silos), buildings for animal production (stables, cowsheds, pig sheds, sheep pens, poultry yards), farmyards. It also includes land used for family or kitchen gardens. It excludes buildings for agro-food manufacture and buildings in rural areas for exclusive residential purpose (paragraph 7.2.29).

Land use classification: classification of land according to the activity undertaken on the land (paragraphs 7.2.8 - 7.2.37).

Land used for agriculture: total of “agricultural land” and “land under farm buildings and farmyards” (paragraph 7.2.37).

Legal status of the holder: juridical aspects under which an agricultural holding is operated (paragraph 7.1.6).

Liquid manure: urine from domestic animals, possibly including a small amount of excrement and/or water (paragraph 7.4.28).

Livestock: all animals, birds and insects kept or reared in captivity mainly for agricultural purposes (paragraphs 7.5.1 - 7.5.2).

Manager: 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 (paragraph 4.21).

Manure: fertilizer prepared from organic material (paragraphs 7.4.28 -7.4.29).

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 10.3).

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 10.14).

Mineral fertilizers: fertilizers prepared from inorganic materials manufactured through an industrial process (paragraph 7.4.24).

Mixed crops: more than one crop grown unsystematically in a plot or field (paragraph 7.4.11).

Net area: area excluding uncultivated patches, bunds, foot paths, ditches, headlands, shoulders and

shelter beds, used when estimating crop areas, yields, and production (paragraph 7.2.20).

Nursery: area where young plants, trees or vines are propagated for the purpose of transplanting (paragraph Annex 4, theme 4, paragraph 22).

Organic agriculture: holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity (Annex 4, theme 6, paragraph 7) .

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 7.4.26).

Organo-mineral fertilizers: materials obtained through blending or processing organic materials with mineral fertilizers to enhance their nutrient content and fertilizing value (paragraph 7.4.25).

Other wooded land: land spanning more than 0.5 ha² with: (i) trees higher than 5 metres and a canopy cover of 5-10 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 7.2.30).

Own-use production work: form of work comprising production of goods and services for own final use (an unpaid form of work) (Annex 10).

Paper and Pen Interview (PAPI): traditional interviewing method whereby enumerators interview the respondents and data is collected by the enumerators using paper questionnaires (paragraph 5.40).

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 (paragraph 4.18).

Permanent crops: crops with a more than one-year growing cycle (paragraph 7.4.22).

Persons in employment: persons of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit (Annex 10).

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 (Annex 10).

Pesticides: any substance, or mixture of substances of chemical, biological, or genetic (synthetic) ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth. (paragraph 7.6.2).

Plot: part or whole of a field on which a specific crop or crop mixture is cultivated (paragraph 4.19).

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 (UN, 2025d, paragraph 1.4).

Production: actual quantity of produce, after drying and processing, ready for sale or consumption (Annex 4, Theme 4, paragraph 9).

Protective cover: a permanent structure with a roof of glass, plastic or other material over a permanent structure, used for protecting crops against the weather, pests or diseases (paragraph 7Annex 4, theme 4 paragraph 25).

Reference group: group of holdings to be tabulated for the item in a tabulation; for example, the item “area irrigated” is only meaningful for holdings with land (paragraph 9.9).

Sample enumeration: in the census of agriculture, it refers to sampling of the whole or part of the target population for the census supplementary modules under the modular approach (paragraphs 5.12).

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 2.37).

Scattered plants: plants or trees planted in such a manner that it is not possible to estimate the area (often around the holding) (paragraph 7.4.22).

Seeds produced by modern biotechnologies: seeds, which possess a novel combination of genetic material obtained through the use of modern biotechnology. This includes genetically modified seeds and gene-edited seeds (Annex 4, theme 6, paragraph 1)

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 re-cultivated (Annex 4, Theme 2, paragraph 14).

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 7.4.28).

Soil conservation practices: sustainable practices to prevent and reverse the degradation of soil through appropriate land use and management practices (Annex 4, Theme 6, paragraph 28).

Solid/farmyard manure: excrement (with or without litter) of domestic animals, possibly including a small amount of urine (paragraph 7.4.28).

Statistical unit: the basic unit for which data are collected.The statistical unit for the census of agriculture is the agricultural holding (paragraph 4.1).

Structural data: data on the basic organizational structures of agricultural holdings that do not significantly change over time, such as holding size, holdings numbers, land tenure, land use, crop area, irrigation, livestock numbers, labour, use of machinery and other agricultural inputs.

Successive crops: temporary crops grown more than once on the same land in the same agricultural year (paragraphs 7.4.8 - 7.4.9).

Table: primary form of presentation of statistical data, involving the summarizing of the results (paragraph 9.2).

Tabulation programme: for an agricultural census, the set of statistical tables prepared to present the main census results (paragraph 9.2).

Temporary crops: crops with a less than one-year growing cycle (paragraph 7.2.18).

Theme: the broad subject heading containing a set of closely related items.

Tillage: any physical loosening of the soil carried out in a range of cultivation operations, either by hand or mechanized (Annex 4, Theme 6, paragraph 20).

Woodland: refers to the area of land satisfying all criteria for either forest land or other wooded land (see relevant entries in this glossary) except the criterion of spanning over 0.5 ha (Annex 4, theme 11, paragraph 4).

REFERENCES AND FURTHER READINGS

Ambrosio, L., Iglesias, L., Marin, C., & Deffence, N. 2023. *Integration of remote sensing data into national statistical office sampling designs for agriculture.* Statistical Journal of the IAOS, vol.39, no.2, pp.473-489, 2023. (also available at: https://content.iospress.com/download/statistical-journal-of-the-iaos/sji220116?id=statistical-journal-of-the-iaos%2Fsji220116)

Azzari, G., Jain, S., Jeffries, G., Kilic, T., & Murray, S. 2021. *Understanding the Requirements for Surveys to Support Satellite-Based Crop Type Mapping*: Evidence from Sub-Saharan Africa. Remote Sensing. 2021, *13*, 4749. (also available at: https://doi.org/10.3390/rs13234749)

Castano, J. 2020 *Censuses of agriculture and COVID-19:* Global situation and lessons**.** Statistical Journal of the IAOS, vol. 36, no.4, 861-865, DOI 10.3233/SJI-200752, IOS Press (https://openknowledge.fao.org/server/api/core/bitstreams/c07f4b8b-bf05-4b25-a7ad-d1a85da5a9a0/content)

David, I.P. 1978. *Non-sampling errors in agricultural surveys:* Review, current findings, and suggestions for future research. Paper presented at the Philippine Statistical Association Annual Conference, 18 June 1978. Manila.

Digital Earth Africa. 2026. *Unlocking the promise of tomorrow from patterns of the past*. In 2020 Digital Earth Africa. [Accessed on xx.zz.yyyy] https://www.digitalearthafrica.org/ © 2020 Digital Earth Africa.

EC, IMF, OECD, UN & WB. 2025. *System of national accounts (SNA)*. New York. https://unstats.un.org/unsd/nationalaccount/sna.asp

ESA. 2026a. *Climate Change Initiative (CCI) time series (1992-2020), the Land Cover project.* In: The European Space Agency (ESA) [online]. France. [Cited xx.zz.yyyy]. https://www.esa-landcover-cci.org/

ESA. 2026b. *ESA WorldCover 2021 Global land cover product at 10m resolution for 2021 based on Sentinel -1 and 2 data.* In: The European Space Agency (ESA) [online]. France. [Cited xx.zz.yyyy]. https://worldcover2021.esa.int/

ESA.2026c. *Network of Resources* (NoR). In: The European Space Agency (ESA) [Accessed on xx.zz.yyyy]. https://nor-discover.org/.

Esposito, M., Tse, T., Khaled, S. & Xiong, L. 2017. Feeding the future of agriculture with vertical farming. Stanford Social Innovation Review. https://doi.org/10.48558/6PB1-BX94

EU. 2026. *Copernicus Land Monitoring Services , Global Dynamic Land Cover (2015-2019).* In: European Union Space Programme (EU) [online]. [Cited xx.zz.yyy]. https://land.copernicus.eu/en/products/global-dynamic-land-cover.

FAO. 1948. *Programme for the 1950 World Census of Agriculture*. Washington. (also available at: http://www.fao.org/3/a-bq471e.pdf)

FAO. 1957. *Programme for the 1960 World Census of Agriculture*. Rome. (also available at: http://www.fao.org/3/cc4152en/cc4152en.pdf)

FAO. 1965. *Program for the 1970 World Census of Agriculture*. Rome. (also available at: http://www.fao.org/3/cc3905en/cc3905en.pdf)

FAO. 1976. *Programme for the 1980 World Census of Agriculture*. Rome. (also available at: http://www.fao.org/3/a-bq479e.pdf)

FAO. 1978**.** *Taking agricultural censuses*. FAO economic and social development paper 1. Rome 1978. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/89fe08de-5f18-45fb-ac25-344132b7aba1/content)

FAO. 1982**.** *Estimation of crop areas and yields in agricultural statistics*. FAO Economic and Social Development Paper, No 22. Rome. (also available at: https://www.fao.org/3/ca6422en/ca6422en.pdf)

FAO. 1983**.** *Community-level statistics*. FAO Economic and Social Development Paper, No 33. Rome. (also available at: https://www.fao.org/3/ca5857en/CA5857EN.pdf)

FAO. 1986. *Programme for the 1990 World Census of Agriculture*. FAO Statistical Development Series No 2. Rome. (also available at: http://www.fao.org/3/a-s8900e.pdf)

FAO. 1995. *Programme for the World Census of Agriculture 2000*. FAO Statistical Development Series No 5. Rome. (also available at: http://www.fao.org/3/bq473e/bq473e.pdf)

FAO. 1996a. *Conducting agricultural censuses and surveys.* FAO Statistical Development Series No 6. Rome. (also available at: https://www.fao.org/3/w9993e/w9993e.pdf).

FAO. 1996b. *A system of economic accounts for food and agriculture.* FAO Statistical Development Series No 8. Rome. (also available at: https://www.fao.org/3/W0010E/W0010E00.htm)

FAO. 1997*. Guidelines on the collection of structural aquaculture statistics*. FAO Statistical Development Series No 5b. Rome. (also available at: https://www.fao.org/3/w7208e/w7208e.pdf)

FAO. 2001. *Pastoralism in the new millennium*. FAO Animal Production and Health Paper No 150. Rome. (also available at: https://www.fao.org/3/Y2647E/Y2647E00.htm)

FAO. 2005a**.** *A system of integrated agricultural censuses and surveys, Vol. 1.* World Programme for the Census of Agriculture 2010. FAO Statistical Development Series No 11. Rome. (also available at: https://www.fao.org/3/a0135e/A0135E00.htm)

FAO. 2005b. The Legal Framework for the management of animal genetic resources. FAO Legislative Study No 89. https://www.fao.org/fileadmin/user_upload/legal/docs/ls89-e.pdf

FAO. 2009. *The state of food and agriculture. Livestock in the balance*. Rome. (also available at: https://www.fao.org/4/i0680e/i0680e.pdf)

FAO. 2011**.** *Green manure/cover crops and crop rotation in Conservation Agriculture on small farms.* Integrated Crop Management, Vol 12-2010. Rome. (also available at: https://www.fao.org/3/i2190e/i2190e.pdf)

FAO. 2012. *Status and trends of animal genetic resources – 2012*. Intergovernmental technical working group on animal genetic resources for food and agriculture. Commission on genetic resources for food and agriculture. October 2012. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/4e75dabd-80d7-43dd-ab4d-c2af92812f72/content)

FAO. 2015a. *World Programme for the Census of Agriculture 2020 Volume 1: Programme, concepts and definitions*. FAO Statistical development Series No 15. Rome (also available at: http://www.fao.org/3/a-i4913e.pdf)

FAO. 2015b. *Technical Report on Cost – Effectiveness of Remote Sensing for Agricultural Statistics in Developing and Emerging Economies*. Rome. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/42d9b92b-9e31-4c6e-b436-1d6389cc1be1/content)

FAO. 2016. *International Standard Statistical Classification of Fishing Gears*, ISSCFG. Rome. (also available at: https://www.fao.org/3/bt988e/bt988e.pdf)

FAO. 2017a. *FAO and the SDGs Indicators* – Measuring up to the 2030 Agenda for Sustainable Development. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/02aa4f60-4c28-4001-aac5-91fd94ca35d3/content)

FAO. 2017b. *Technical Report on Reconciling Data from Agricultural Censuses and Surveys*. Publication prepared in the framework of the Global Strategy to improve Agricultural and Rural Statistics. Rome.. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/c753b388-e195-4a42-95f1-a0d69b618966/content)

FAO. 2018a. World Programme for the Census of Agriculture 2020. Operational Guidelines, Volume 2. FAO Statistical development Series No 16. Rome.. (also available at: https://www.fao.org/3/CA1963EN/ca1963en.pdf)

FAO. 2018b. *Handbook on the Agricultural Integrated Surveys (AGRIS).* Global Strategy to improve Agricultural and Rural Statistics.. (also available at: https://www.fao.org/3/ca6412en/ca6412en.pdf)

FAO. 2019. *The International Code of Conduct for the sustainable use management of fertilizers*. Rome. (also available at: https://www.fao.org/3/ca5253en/CA5253EN.pdf)

FAO. 2021a. *Global review of agricultural census methodologies and results (2006–2015)*. World Programme for the Census of Agriculture 2010. FAO Statistical Development Series No 18. Rome. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/70a91201-4a10-4257-bf85-4f275dbffe17/content)

FAO. 2021b. *Classification and illustrated definition of fishing gears.* FAO Fisheries and Aquaculture Technical Paper No 672. Rome. (also available at: https://www.fao.org/3/cb4966en/cb4966en.pdf)

FAO. 2022a. *Using small area estimation for data disaggregation of SDG indicators*. Case study based on SDG Indicator 5.a.1. Rome. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/1d302e87-6819-4ab2-a207-0f8897bccbf6/content)

FAO. 2022b. *GLEAM v3 Dashboard. In: Global Livestock Environmental Assessment Model (GLEAM) Shiny Apps.* [Cited xx.zz.yyyy]. https://foodandagricultureorganization.shinyapps.io/GLEAMV3_Public/)

FAO. 2022c. *The future of food and agriculture. Drivers and triggers for transformation.* 2022. The Future of Food and Agriculture, No 3. Rome. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/002ef5c5-3501-413f-b226-c87da30a7a29/content)

FAO.2024a. *Crop type mapping in Zimbabwe.* In: Use of Earth Observation Data Team (FAO-EOSTAT). Rome. [Cited: xx.zz.yyyy] https://storymaps.arcgis.com/stories/a910fff891d947d986cb7d04bd022dd5

FAO. 2024b. *System for earth observations, data access, processing and analysis for land monitoring (SEPAL).* [Accessed on xx.zz.yyyy] https://www.fao.org/in-action/sepal/en © Copyright 2020-2024, the SEPAL development team.

FAO. 2024c. *Land statistics 2021-2022. Global, regional and country trends*. FAOSTAT Analytical brief No 88. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/b359009a-d35d-47af-aca2-fd6a5bc71980/content

FAO. 2025a. Agricultural Integrated Survey Programme (AGRISurvey). FAO. [online]. Rome [Cited xx.zz.yyyy] https://www.fao.org/in-action/agrisurvey/en/.

FAO. 2025b. In: *SDG Indicators Data Portal.* . FAO. [online]. Rome. [Cited xx.zz.yyyy] https://www.fao.org/sustainable-development-goals-data-portal/data/en

FAO. 2025c. *In: AQUASTAT, FAO's Global Information System on Water and Agriculture*. FAO. [online] Rome [Cited xx.zz.yyyy] https://www.fao.org/aquastat/en/.

FAO. 2026. *Use of Earth Observation Data (FAO-EOSTAT).* FAO. [online]. Rome. [Cited: xx.zz.yyyy] https://www.fao.org/in-action/eostat.

FAO, Rikolto and RUAF. 2022. Urban and peri-urban agriculture sourcebook – From production to food systems. Rome, FAO and Rikolto. https://openknowledge.fao.org/server/api/core/bitstreams/0bd766db-e6e7-4e53-860b-248de7e983e8/content.

FAO & UNFPA. 2012. *Guidelines for linking population and housing censuses with agricultural censuses.* Special Issue of the FAO Statistical Development Series. Rome. (also available at: https://www.fao.org/4/i2680e/i2680e.pdf)

FAO & WHO. 2006. Codex Alimentarius: Organically produced food. *Joint FAO/WHO Food Standards Programme Codex Alimentarius Commission*. Organically produced foods, 2nd Edition. Rome. (also available at: https://www.fao.org/3/a0369e/a0369e.pdf)

FAO & WHO. 2014. *The International Code of Conduct on Pesticide Management.* Rome. (also available at: https://www.fao.org/3/i3604e/i3604e.pdf)

Gallego, F.J. 2004. Remote Sensing and Land Cover Area Estimation*. International Journal of Remote Sensing*, 25, 3019-3047. (also available at: https://www.tandfonline.com/doi/epdf/10.1080/01431160310001619607?needAccess=true)

GEE. 2026. *Google Earth Engine.* A planetary- scale platform for Earth science data & analysis. [Accessed on xx.zzz.yyyy]. https://earthengine.google.com/

Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. & Tempio, G. 2013. *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities*. FAO. Rome. (also available at: https://www.fao.org/4/i3437e/i3437e.pdf)

Global Strategy. 2010. *Global Strategy to Improve Agricultural and Rural Statistics*. World Bank and FAO.(also available at: openknowledge.worldbank.org/server/api/core/bitstreams/ef53654f-89ee-5fd9-92b5-d0efff9afa73/content)

Global Strategy. 2014. *Providing access to agricultural microdata: A guide.* FAO. Rome. (also available at: https://www.fao.org/3/ca6407en/ca6407en.pdf)

Global Strategy. 2015a. *Handbook on Master Sampling Frame for Agricultural Statistics*. Frame Development, Sample Design and Estimation. FAO. Rome (also available at: https://www.fao.org/3/ca6398en/ca6398en.pdf)

Global Strategy. 2015b. *Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework.* FAO. Rome. (also available at: https://www.fao.org/3/ca6405en/ca6405en.pdf)

Global Strategy. 2017. *Handbook on Remote Sensing for Agricultural Statistics*. FAO. Rome. (also available at: https://www.fao.org/3/ca6394en/ca6394en.pdf)

Global Strategy. 2018. *Handbook on crop statistics: improving methods for measuring crop area, production and yield.* FAO. Rome. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/257243dc-35c7-4f37-b5bc-d05b8088094c/content)

Global Strategy. 2025. *Global Strategy to Improve Agricultural and Rural Statistics.* FAO [online]. Rome. [Cited xx/vv/yyyy]. https://www.fao.org/in-action/global-strategy-agricultural-statistics)

Henrich, V., Krauss, G., Götze, C. & Sandow, C. 2012: *Index Data Base (IDB)*, A database for remote sensing indices. Entwicklung einer Datenbank für Fernerkundungsindizes. AK Fernerkundung, Bochum, 4.-5. 10. (also available at: www.indexdatabase.de)

IFOAM Organic International. 2025. In: Participatory Guarantee System (PGS) [online]. Bonn. [Cited

xx.zz.yyyy]. https://www.ifoam.bio/our-work/how/standards-certification/participatory-guarantee-systems

IHSN. 2009. *Principles and good practice for preserving data*. International Household Survey Network, IHSN Working Paper No 003, December. (also available at: https://ihsn.org/sites/default/files/resources/IHSN-WP003.pdf)

IIA. 1939. *The First World Agricultural Census (1930) – Vol. I: Standard form, Methodological Study, Notes on tabulation of the census results*. Rome. (also available at: http://www.fao.org/3/a-bq667e.pdf)

ILO. 1993. International Classification of Status in Employment (ICSE).

ILO. 2009. *Report of the Conference. 18th International Conference of Labour Statisticians*, 24 November – 5 December 2008. Geneva. (also available at: https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40dgreports/%40stat/documents/meetingdocument/wcms_101467.pdf

ILO. 2013. *Report II - Statistics of work, employment and labour underutilization*. 19th International Conference of Labour Statisticians, 2-11 October 2013. Geneva. (also available at: https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40dgreports/%40stat/documents/publication/wcms_220535.pdf)

ILO. 2023a. *Resolution to amend the 19th ICLS resolution concerning statistics of work, employment and labour underutilization.* 21ST International Conference of Labour Statisticians, 11-20 October 2023. Geneva. (also available at: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf)

ILO. 2023b. *International Classification of Status of Employment (ICSE-18).* (also available at:https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40dgreports/%40stat/documents/publication/wcms_894615.pdf)

Masoud, K. M., Persello, C., & Tolpekin, V. A. 2020. Delineation of Agricultural Field Boundaries from Sentinel-2 Images Using a Novel Super-Resolution Contour Detector Based on Fully Convolutional Networks. *Remote Sensing*, 12(1), 59. (also available at: https://www.mdpi.com/2072-4292/12/1/59)

Notenbaert, A.M.O., Herrero, M., Kruska, R.L., You, L., Wood, S., Thornton, P.K. & Omolo, A. 2009*. Classifying livestock production systems for targeting agricultural research and development in a rapidly changing world.* (also available at: https://cgspace.cgiar.org/items/d5b5122a-7e6c-4c6d-86de-cefcee60b306)

OpenEO*.* 2026. *A common, open-source interface between earth observation data infrastructure and front-end applications.* EU. [Accessed on xx.zz.yyyy]. https://openeo.org/

Seré Rabé, C. & Steinfeld, H. 1996. World livestock production systems. Animal production and health paper No 127. FAO. Rome. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/15cb8917-378c-40ef-9aab-9684def0e84c/content)

Teufel, N., Markemann, A., Kaufmann, B., Valle Zárate, A. & Otte, J. 2010**.** *Livestock Production Systems in South Asia and the Greater Mekong Sub-Region.* A Quantitative Description of Livestock Production in Bangladesh, Cambodia, India, Lao PDR, Nepal, Pakistan, Sri Lanka, Thailand, and Viet Nam. Pro-Poor Livestock Policy Initiative (PPLPI) Working paper No 48. FAO. Rome. (also available at: https://openknowledge.fao.org/server/api/core/bitstreams/cb486a0e-4528-4582-b5a3-8422607dbb35/content)

UN. 2019. *Guidelines for Producing Statistics on Asset Ownership from a Gender Perspective.* New York: United Nations. Serie F No 119. (also available at: https://unstats.un.org/edge/publications/docs/Guidelines_final.pdf)

UN. 2025a. *International standard industrial classification of all economic activities*, Revision 5. Draft

Structure of ISIC, Rev. 5. Background document. New York (also available at: https://unstats.un.org/UNSDWebsite/statcom/session_54/documents/BG-3j-ISIC-Rev5-E.pdf)

UN.2025b. *Central Product Classification (CPC) version 3.0*. New York. (also available at: https://unstats.un.org/unsd/classifications/CPC/Documents/3-Proposed-CPC-Ver3-Structure-20Nov2023.pdf

UN. 2025c. *Evidence and Data for Gender Equality (EDGE)* - Improving Existing Efforts to Generate Internationally Comparable Gender Indicators [online]. [Cited xx.zz.yyyy] https://unstats.un.org/edge

UN. 2025d. *Principle and recommendations for population and housing censuses, revision 4.* New York.

UN*.* 2025e. *The System of National Accounts. Towards the 2025 SNA In:* Intersecretariat Working Group on National Account (ISWGNA), UN. [online]. New York. [Cited xx.zz.yyyy] https://unstats.un.org/unsd/nationalaccount/SNAUpdate/2025/chapters.asp

UN, EU, FAO, IMF, OECD & WB. 2014. System of environmental and economic accounting 2012 (SEEA). New York. (also available at: https://unstats.un.org/unsd/envaccounting/seearev/seea_cf_final_en.pdf)

UN, UN-GGIM & UNSC. 2019. *The Global Statistical Geospatial Framework (The GSGF).* Global Geospatial Information Management Secretariat. New York\. (also available at: https://ggim.un.org/meetings/GGIM-committee/9th-Session/documents/The_GSGF.pdf)

UNECE. 2011. *Canberra Group Handbook on household income statistics* (2nd ed.). Geneva. (also available at: https://unece.org/fileadmin/DAM/stats/groups/cgh/Canbera_Handbook_2011_WEB.pdf)

UNESCO. 2011. *International standard classification of education – ISCED 2011.* Montreal. (also available at: https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf)

UNFCCC. 2015*. Paris Climate Agreement (Paris, 2015).* UN Climate Change Conference (COP 21) Paris, France 2015. https://unfccc.int/process-and-meetings/the-paris-agreement

UNSC. 2017. *Cape Town Global Action Plan for Sustainable Development Data.* Prepared by the High-level Group for Partnership, Coordination and Capacity-Building for Statistics for the 2030 Agenda for Sustainable Development. March 2017. (also available at: https://unstats.un.org/sdgs/hlg/Cape_Town_Global_Action_Plan_for_Sustainable_Development_Data.pdf)

WCO. 2022*. Harmonized Commodity Description and Coding System* (HS) Edition 2022. (also available at: https://www.wcoomd.org/en/topics/nomenclature/instrument-and-tools/hs-nomenclature-2022-edition/hs-nomenclature-2022-edition.aspx)